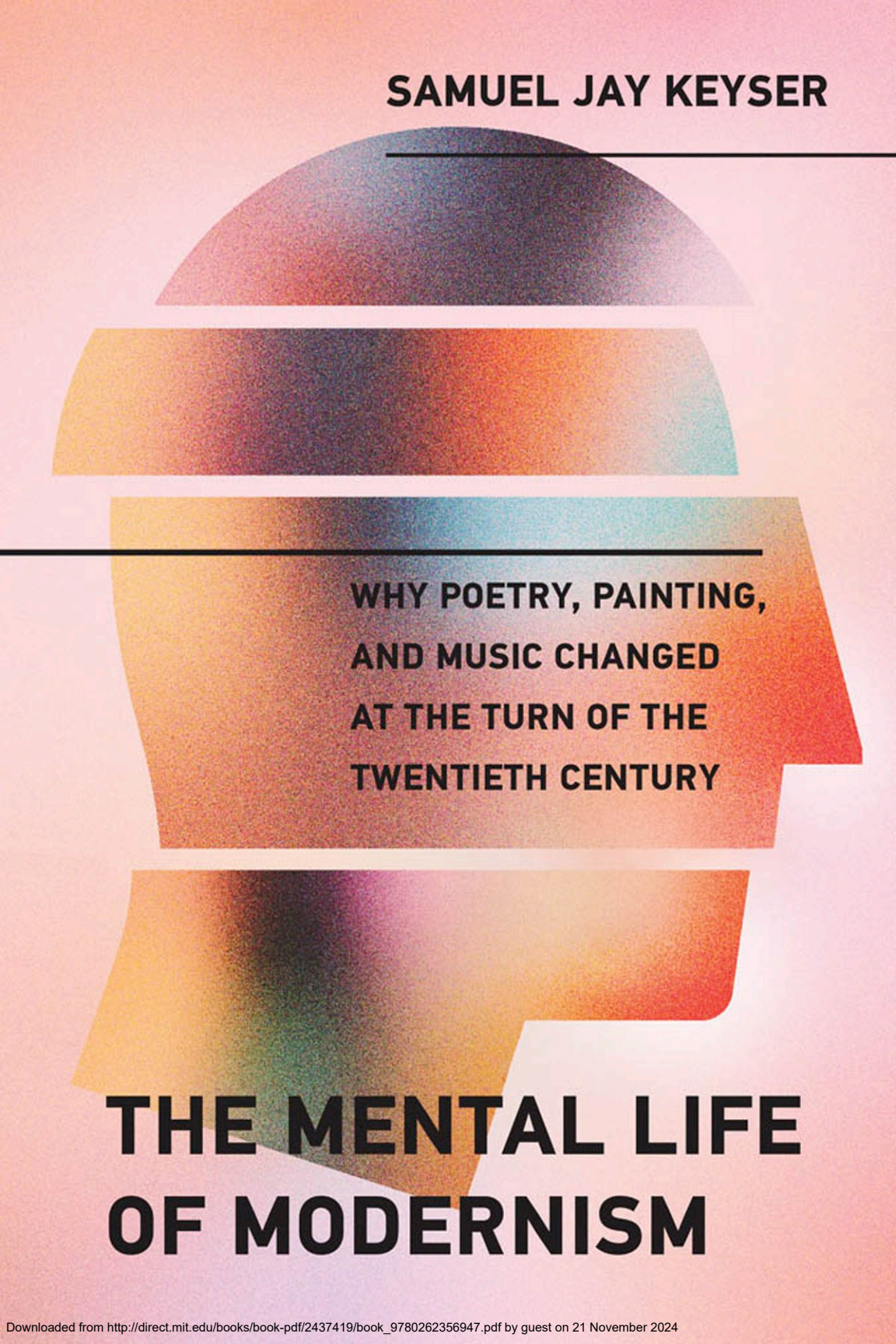

SAMUEL JAY KEYSER
WHY POETRY, PAINTING, AND MUSIC CHANGED AT THE TURN OF THE TWENTIETH CENTURY
THE MENTAL LIFE OF MODERNISM

Downloaded from http://direct.mit.edu/books/book-pdf/2437419/book_9780262356947.pdf by guest on 21 November 2024

Downloaded from http://direct.mit.edu/books/book-pdf/2437419/book_9780262356947.pdf by guest on 21 November 2024

The Mental Life of Modernism

Downloaded from http://direct.mit.edu/books/book-pdf/2437419/book_9780262356947.pdf by guest on 21 November 2024

Downloaded from http://direct.mit.edu/books/book-pdf/2437419/book_9780262356947.pdf by guest on 21 November 2024

The Mental Life of Modernism

Why Poetry, Painting, and Music Changed at the Turn of the Twentieth Century

Samuel Jay Keyser

The MIT Press
Cambridge, Massachusetts
London, England

Downloaded from http://direct.mit.edu/books/book-pdf/2437419/book_9780262356947.pdf by guest on 21 November 2024

© 2020 Massachusetts Institute of Technology

This work is subject to a Creative Commons CC-BY-NC-ND license.

Subject to such license, all rights are reserved.

The open access version of this book is made possible due to generous funding from MIT Libraries.

This book was set in Sabon by Toppan Best-set Premedia Limited.

Library of Congress Cataloging-in-Publication Data

Names: Keyser, Samuel Jay, 1935- author.
Title: The mental life of modernism : why poetry, painting, and music changed at the turn of the twentieth century / Samuel Jay Keyser.
Description: Cambridge, MA : The MIT Press, [2019] | Includes bibliographical references and index.
Identifiers: LCCN 2019015777 | ISBN 9780262043496 (hardcover)
Subjects: LCSH: Arts—Psychology. | Communication in art. | Modernism (Art) | Modernism (Literature) | Modernism (Music)
Classification: LCC NX165 .K45 2019 | DDC 700.1/9—dc23
LC record available at https://lccn.loc.gov/2019015777

10 9 8 7 6 5 4 3 2 1

Downloaded from http://direct.mit.edu/books/book-pdf/2437419/book_9780262356947.pdf by guest on 21 November 2024

To Noam Chomsky, friend, colleague, and catalyst, for over half a century

Downloaded from http://direct.mit.edu/books/book-pdf/2437419/book_9780262356947.pdf by guest on 21 November 2024

Downloaded from http://direct.mit.edu/books/book-pdf/2437419/book_9780262356947.pdf by guest on 21 November 2024

Contents

Preface ix
Acknowledgments xi

1 Introduction 1

2 Christopher, Impossible Rules, and the Mental Life of Modernism 11

3 Private Format as Easter Eggs 17

4 The Need for Rules 29

5 "Meaning isn't everything … but it is something, dammit" 31

6 "Certain Conditions of Form and Organization": The Rules of Meter and Rhyme 41

7 Rules of Tonal Music: Grouping, Tonal, and Metrical 69

8 The Rules of Mimetic Art 77

9 The Twentieth Century Abandons the Rules: The Age of the Private Format 97

10 Recursion: A Shared Format? 133

11 The End of -isms 149

12 What Does It Mean? 167

Appendix A: From Igor Stravinsky, *The Poetics of Music in the Form of Six Lessons* 181
Appendix B: Noam Chomsky, Personal Communication, October 19, 2017 183
Notes 187
References 209
Index 219

Downloaded from http://direct.mit.edu/books/book-pdf/2437419/book_9780262356947.pdf by guest on 21 November 2024

Downloaded from http://direct.mit.edu/books/book-pdf/2437419/book_9780262356947.pdf by guest on 21 November 2024

Preface

There's an old saying: *Chance favors the prepared mind*. This book is corroboration. As it happened, I lived down the hall from a couple whose daughter, Amy Lieberman, is a classical music conductor. One evening in February 2016, Larry, her proud father, mentioned a concert that she had just conducted at the American Academy of Arts and Sciences in Cambridge, Massachusetts. Guillaume de Machaut, a fourteenth-century medieval French composer and poet—possibly an acquaintance of Chaucer, certainly known and admired by Chaucer—had written a poem called "Ma fin est mon commencement" that he had set to music. My interest in the piece was spurred by Ms. Lieberman's program notes to that performance.

I had written an article on the role of reversal in Edgar Allan Poe and Wallace Stevens (Keyser 2011). I was interested in the kind of thing that Roman Jakobson had noticed in Poe's "The Raven," namely, that the only word the raven spoke was *nevermore* and that the consonants in the word *raven* mirror the consonants in the word *never*: *r-v-n/n-v-r*. This device has a technical name, chiasmus.

I was delighted to find yet another example of chiasmus in Machaut's composition, but I was puzzled as well. I had noticed chiasmatic patterns in the work of Geoffrey Chaucer, I had found them as well in the poetry of Poe and Stevens, and now I was seeing the same rhetorical device in a fourteenth-century musical composition. Something was going on. I was certain the similarities were significant. But I didn't know in what way.

Over dinner later that same year, Noam Chomsky mentioned an idea he had advanced 50 years earlier at a meeting at Harvard University. At the time, it fell on deaf ears and he put it aside. The idea was as striking as it was simple. Two seismic events—the shift in scientific thinking

Downloaded from http://direct.mit.edu/books/book-pdf/2437419/book_9780262356947.pdf by guest on 21 November 2024

resulting from the "Galilean revolution" coupled with Newton's epochal formulation of the principle of action at a distance, and the shift that took place in the sister arts of poetry, painting, and music that goes by the name of "modernism"—are the same phenomenon: the brain reaching the limits of its natural predilections and being forced to look elsewhere for inspiration.

That night at dinner I was listening. I remember replying that not only did I think he was right, but that I thought a strong case could be made from the point of view of the arts. His comment had made me see the role that structures like reversal play in the arts in a completely new light.

In this book, I argue that the sea change that the sister arts of poetry, painting, and music underwent at the turn of the twentieth century is the result of the abandonment of a natural aesthetic based on shared sets of rules between artist and audience, shared in the same way that the rules of English are shared by the readers of this sentence and its author. Further, the abandonment of these rules and the abandonment of the mechanistic philosophy of the Galilean revolution and of Descartes are the same phenomenon: brain encountering limitations and having done so, employing new strategies.

If successful, the present work will have demonstrated that one of the most important movements in Western cultural history, the shift to modernism, was initiated by internal mental constructs abetted by subsequent cultural phenomena and not the other way around. Think of it as the Zanclean flood, the flood that more than 5 million years ago filled the empty cavity where the Mediterranean now sits.

About 6 million years back, tectonic plate shifts had shut the Mediterranean off from the Atlantic Ocean, creating a huge land-locked sea. Exhausted by evaporation, it became a vast hole in the ground. Half a million years later, the Atlantic Ocean breached the west end of that immense basin at what is now the Strait of Gibraltar. Water poured back in. It took anywhere from a few months to two years to fill up. But once the Mediterranean Sea was in place, the environment changed dramatically. Culture began to do its thing.

The same is true with modernism. Abandoning the premodernist rules was the counterpart of filling the Mediterranean hole in the ground. A completely new environment was created, one that cultural phenomena began to shape. This book is about modernism's Zanclean flood, its counterpart to the breaching of Gibraltar.

Downloaded from http://direct.mit.edu/books/book-pdf/2437419/book_9780262356947.pdf by guest on 21 November 2024

Acknowledgments

I am grateful to John Bailyn, Thomas Bever, Sylvain Bromberger, John Halle, Morris Halle, Ellen Harris, David Hoos, Sabine Iatridou, Nancy Kanwisher, Fred Lerdahl, Amy Lieberman, Virginia Newes, Steve Pinker, Deb Roy, Donca Steriade, Michael Strauss, Dan Wallace, and Maria Luisa Zubizarreta for invaluable discussions.

I want to thank those who attended presentations of this material at Harvard University, MIT, Stony Brook University, Tel Aviv University, the University of Arizona, the University of Southern California, and UCLA for comments and criticisms.

I would like to thank Oliver Halsman Rosenberg, Philippe Halsman's grandson, for bringing to my attention details surrounding the Salvador Dali/Philippe Halsman collaboration on *In Voluptate Mors* and in particular the relevant discussion in his grandfather's book *Sight and Insight*.

I am indebted to the five anonymous readers of this book as indeed should you, the reader, be. Their criticisms, both negative and positive, have made this a better book.

I am indebted to Marc Lowenthal for many critical suggestions and important observations drawn from his experience as an art student and a student of comparative French literature before becoming my acquisitions editor at MIT Press.

Special thanks to Anthony Zannino for his invaluable help in hacking through the thicket of permission procurement, as well as to Marcy Ross, who, as MIT Press production editor, smoothed the way for me to work on the edited copy of this book.

I am eternally grateful to the reference librarians at MIT's Hayden Library and Lewis Music Library, their technical staff, and the anonymous staff who answered the phone when I called and led me to experts

Downloaded from http://direct.mit.edu/books/book-pdf/2437419/book_9780262356947.pdf by guest on 21 November 2024

like Tina Chan, Lisa Horowitz, Forrest Larson, Christine Sherritt, and Mark Szarko. Their ability to find the unfindable reference and fix the unfixable bug was extraordinary.

Thanks also to the members of MIT's Moses Seminar for trenchant criticism and moral support.

I'm especially indebted to Ray Jackendoff for his seminal work with Fred Lerdahl on the theory of tonal music adopted here, for his friendship, and for his extraordinarily helpful comments and steadfast support throughout the writing of this book.

Without Noam Chomsky, there would be no book. His insight of over 50 years ago was the catalyst for this study.

The same is true of my wife, Nancy Kelly. Without her support, I would not have found at this stage of my life the strength to take on this task.

Finally, I want to thank my copy editor and friend for over 50 years, Anne Mark. She is an editorial Midas. Every sentence she touches is all the more valuable because of her touch.

The insights of all of these friends and scholars have been invaluable. I could not have written this book without them. I am, of course, obliged to free them from any responsibility for whatever missteps I have made.

Downloaded from http://direct.mit.edu/books/book-pdf/2437419/book_9780262356947.pdf by guest on 21 November 2024

1
Introduction

This book is about modernism, the period in the arts ushered in at the end of the nineteenth and beginning of the twentieth centuries. It focuses on the so-called sister arts: poetry, painting, and music.[1] It does so because these art forms, more than any others, can be characterized from the point of view of shared rule systems.[2]

Modernism is remarkable because the sister arts each underwent a sea change at virtually the same time. Music ceased to be tonally centered; meter was elbowed aside so that, as Robert Frost famously said, writing free verse resembled "playing tennis with the net down"; and painting reflected the material, the manner, and the artist rather than the subject matter.

In his book *The Blank Slate*, Steven Pinker (2002, 409–410) describes the changes in this fashion:

> Modernism certainly proceeded *as if* human nature had changed. All the tricks that artists had used for millennia to please the human palate were cast aside. In painting, realistic depiction gave way to freakish distortions of shape and color and then to abstract grids, shapes, dribbles, splashes, and, in the $200,000 painting featured in the recent comedy *Art*, a blank white canvas. … In poetry, the use of rhyme, meter, verse structure, and clarity were frequently abandoned. In music, conventional rhythm and melody were set aside in favor of atonal, serial, dissonant, and twelve-tone compositions.

Pinker's view is that modernism and postmodernism went off the rails when they turned their backs on human nature. Many would disagree with that assessment, finding great works of art after the shift comparable to those before (see, e.g., Aviv 2014). Be that as it may, Pinker's emphasis on the centrality of human nature is right on target. In what follows, I describe what happened to alter the artistic direction of the sister arts from a cognitive perspective. I leave aside value judgments regarding the art the new movement produced.

Downloaded from http://direct.mit.edu/books/book-pdf/2437419/book_9780262356947.pdf by guest on 21 November 2024

Modernism was an event that posed an obvious question: Why? Oceans of ink, as they say, have been spilled answering it. Most of the explanations are based on cultural, political, economic, and/or sociological factors: the rise of the bourgeoisie, technological innovation in photography, and apocalyptic presentiments at the turn of the century.[3] (Recall the Y2K anxieties that gathered like storm clouds before the fateful coming of the year 2000.)[4]

Proponents of all and only cultural explanations base their claims on assumptions like those of Gary Saul Morson and Morton Shapiro (2017, 9):

> [P]eople are not organisms that are made and then dipped in some culture, like Achilles in the river Styx. They are cultural from the outset. A person before culture is not a person at all. This idea of a person before culture resembles a Zen koan, like the sound of one hand clapping. To be sure, economists are not the only thinkers who typically treat culture as an add-on rather than as essential—some political philosophy does the same. But whether we are speaking of mainstream economics or … behavioral economics, *the temptation of claims aspiring to universality, and of models reducible to equations, makes the idea of acultural humanness especially appealing* [italics mine].

This stance shuts the door on a great deal that has been discovered about human nature that could prove valuable in understanding what have heretofore been considered cultural phenomena. This book will try to show how "claims aspiring to universality" and "models reducible to equations" can, in fact, shed light where cultural explanations fall short.

At the outset, it is worth noting that when it comes to modernism, none of the cultural accounts generalize across the sister arts even though what happened to them seems to call for a single explanation. Could it just be a coincidence that all three art forms changed radically at virtually the same time?

The famous art critic Clement Greenberg took the position that painting did a complete volte-face from bending over backward to hide its medium to doing everything it could to call attention to it (1993, 86):

> Realistic, naturalistic art had dissembled the medium, using art to conceal art; Modernism used art to call attention to art. The limitations that constitute the medium of painting—the flat surface, the shape of the support, the properties of the pigment—were treated by the Old Masters as negative factors that could be acknowledged only implicitly or indirectly. Under Modernism these same limitations came to be regarded as positive factors, and were acknowledged openly. Manet's became the first Modernist pictures by virtue of the frankness with which they declared the flat surfaces on which they were painted.

Downloaded from http://direct.mit.edu/books/book-pdf/2437419/book_9780262356947.pdf by guest on 21 November 2024

This was undoubtedly true of painting. But it is hard to see what that has to do with "playing tennis with the net down" in poetry or abandoning tonal centers for 12-tone sequences in music.

Eric Kandel (2012, 11–12) offers this explanation for the volte-face in painting:

> Modernism began in the mid-nineteenth century as a response not only to the restrictions and hypocrisies of everyday life, but also as a reaction to the Enlightenment's emphasis on the rationality of human behavior. …
>
> The modernist reaction to the Enlightenment came in the aftermath of the Industrial Revolution, whose brutalizing effects revealed that modern life had not become as mathematically perfect, or as certain, rational, or enlightened, as advances in the eighteenth century had led people to expect. Truth was not always beautiful, nor was it always readily recognized. It was frequently hidden from view. Moreover, the human mind was governed not only by reason but also by irrational emotion.
>
> As astronomy and physics inspired the Enlightenment, so biology inspired Modernism. …
>
> This new view led to a reexamination in art of the biological nature of human existence, as evident in Édouard Manet's *Déjeuner sur l'Herbe* of 1863, perhaps the first truly modernist painting from both a thematic and stylistic point of view. Manet's painting, at once beautiful and shocking in its depiction, reveals a theme central to the modernist agenda: the complex relationship between the sexes and between fantasy and reality.

So Kandel saw the modernist agenda as reflecting the tension between fantasy and reality. But again, where do free verse and atonality fit in with that scenario?

Still others saw modernist painting as a reaction to the skill that Renaissance artists brought to realistic representation. Rudolf Arnheim (1974, 134–135) puts the argument this way:

> Evidently, the Renaissance artists practiced the new skill of faithful projection not only in tribute to the ideal of scientifically authenticated realism, but because of the inexhaustible variety of appearances derivable from natural objects in this fashion and the corresponding wealth of individual interpretation. It is not surprising that this extreme exploitation of projective distortion eventually led to a radical countermovement, a return to elementary shapes and the elementary schemata of permanent structural norms. The reaction became conspicuous in the geometrical simplifications of Seurat and Cézanne and the primitivism pervading much art of the early twentieth century.

The idea here is apparently that the postural inventiveness illustrated by, for example, the contortions of Michelangelo's *ignudi* in the Sistine Chapel ceiling frescoes was so extreme that it demanded a counterreaction in the form of modernism.[5]

Downloaded from http://direct.mit.edu/books/book-pdf/2437419/book_9780262356947.pdf by guest on 21 November 2024

There have been other (cultural) explanations. They range from the impact of the Industrial Revolution that led to the introduction of ordinary folk as subjects as in Jean-François Millet's *The Sower*, *The Gleaners*, and *The Potato Harvest*, to psychoanalytic accounts such as Kandel's Freudian take on *Déjeuner sur l'herbe*,[6] to the impact of technology.[7] Upon seeing a daguerreotype in 1839, the painter Paul Delaroche is supposed to have declared, "From today, painting is dead."[8]

But when we shift genres, we find that such explanations don't generalize. Not that they should, but it would, at the very least, be intriguing if we found one that did. Richard Taruskin, author of the monumental *Oxford History of Western Music*, ascribes the changes in music to "apocalyptic presentiments" at the end of the nineteenth century. The opening chapter of volume 4 is entitled "Reaching (for) Limits: Modernism: Mahler, Strauss, Schoenberg." Taruskin believes that the beginnings of modernism, the period from 1890 to 1914, ought to be called "maximalism," a period during which "apocalyptic presentiments" drove composers to maximize on a number of fronts. Compositions got longer. Wagner's *Ring Cycle* takes 16 hours or more to perform. The range of key relationships in Wagner increased. Dissonance intensified, including longer and longer intervals before resolution, presumably to involve the listener more deeply.[9] This is why Taruskin chooses a quotation from Ezra Pound (1977, 38) as the epigraph to volume 4:

> This is the whole flaw of "emotional" music. It is like a drug: you must have more drug, and more noise each time, or this effect, this impression which works from the outside, in from the nerves and sensorium upon the self—is no use, its effect is constantly weaker and weaker.

Once again, it is hard to see how apocalyptic presentiments could have led to free verse or attention to the medium instead of the representation, or indeed to maximalism itself.

Accounts like these are part and parcel of theories of culture writ large. But cultural theories are very hard to pin down, as Colin Martindale (1990, 19) observes:[10]

> Although a [cultural] theory is supposed to explain the relevant facts about a phenomenon, in art or literary history there is no real consensus about these facts. Narrative historians present us with a congeries of facts and dates and speculations. Because such historians do not usually admit that they have a theory, they do not need to tell us why they are presenting these data. If one did not have at least an implicit theory to write history, one would be confronted with pure chaos … , ignorant of what to report and what to leave out.

Downloaded from http://direct.mit.edu/books/book-pdf/2437419/book_9780262356947.pdf by guest on 21 November 2024

E. H. Gombrich (1969, 9–10) has argued that one implicit theory, at least for several cultural historians, was provided by Hegel. He pictures Hegel's theory of cultural history

> as a wheel from the hub of which there radiate eight spokes. These spokes represent the various concrete manifestations of the national Spirit, in Hegel's words "all the aspects of its consciousness and will". They are the nation's religion, constitution, morality, law, customs, science, art and technology. These manifestations which are visible on the periphery of my wheel must all be understood in their individual character as the realizations of the *Volksgeist*. They all point to a common centre. In other words, from whichever part on the outside of the wheel you start moving inwards in search of their essence, you must ultimately come to the same central point. If you do not, if the science of a people appears to you to manifest a different principle from that manifested in its legal system, you must have lost your way somewhere.

Gombrich disagrees with this picture. He describes the breakdown of the Hegelian tradition (pp. 41–42) as stemming

> from the chastening insight that no culture can be mapped out in its entirety, but no element of this culture can be understood in isolation. It appears as if the cultural historian were thus still left without a viable programme, grubbing among the random curiosities of antiquarian lore.
>
> I realize that this perplexity looks pretty formidable in the abstract, but I believe it is much less discouraging in practice.

In a review of Gombrich 1969, Leonard Meyer (1970, 398) describes Gombrich's position:

> In the section of his essay entitled "Hegelianism without Metaphysics," Gombrich makes it clear that a number of cultural historians and art historians were tainted with a kind of secular Hegelianism. Wölfflin and Lamprecht, Marx and Dilthey, Huizinga and Panofsky—all favored a holistic approach to culture and cultural change. Gombrich readily admits that "there is something in the Hegelian intuition that nothing in life is ever isolated, that any event and any creation of a period is connected by a thousand threads with the culture in which it is embedded," but he observes that "it is one thing to see the interconnectedness of things, another to postulate that all aspects of a culture can be traced back to one key cause of which they are manifestations."

Meyer (1970, 399) concludes his review with what appears to be his own brand of secular Hegelianism:

> Students—non-musicians as well as musicians—can learn to hear the style changes linking Beethoven to Wagner, Wagner to Mahler, and Mahler to Schönberg; and some of them will come to understand and be enthralled by the works of these masters. And the same can, I am confident, be done in the other arts and for other aspects of culture. To experience this continuity (and to appreciate the masterpieces of our tradition) is one thing, to *explain* such

Downloaded from http://direct.mit.edu/books/book-pdf/2437419/book_9780262356947.pdf by guest on 21 November 2024

> style changes is quite another. And it is, I take it, the goal of cultural history not only to explain the histories of particular parameters (styles, movements, institutions, and the like), but to relate these to one another and to account for their intricate interaction in some coherent and consistent way.

The form of explanation I adopt would, I think, take Meyer quite by surprise.[11] My aim is to show that what happened in the sister arts was, as Meyer (and Gombrich as well, for that matter) would have it, "coherent and consistent," but not in the usual way. That is to say, what happened to set the stage for modernism was not a response to hypocrisy, or a reaction to rationality, to apocalyptic presentiments, to the brutality of the Industrial Revolution, or to the invention of the daguerreotype. My basic assumption is that, as Hegelians (secular or non-) would expect, the sister arts of poetry, painting, and music all have something in common. What would surprise the Hegelians—Morson and Shapiro (2017) among them—is what I assert that commonality to be.

The sister arts of poetry, painting, and music all depend upon a shared set of rules in precisely the same way that communicating depends upon a speaker and a hearer having internalized the shared rule set of their language, called grammar.

Like many others, I presuppose a natural aesthetic.[12] However, unlike the others, I have in mind an aesthetic based on sets of rules, shared between an artist and the artist's audience. These rules reflect hardwired functions of the brain, such as the ability to speak a language, the ability to parse tonal music, the ability to perceive metrical units like poetic feet, and, as we will see, certain built-in predispositions of the visual system.

My assumption is that the exercise of these rules in the minds of the audience caused by the works of artists sharing the same sets of rules is the source, at least in part, of the pleasure we experience from these art forms. It is this interaction via rule sets between artist and audience that I refer to as the natural aesthetic.

My claim is that the rule systems that formed the basis for the natural aesthetic were abandoned by the modernist poets, painters, and composers, who replaced shared rules with private formats, formats that were in no sense "natural" because they were the individual constructs of the artist. This resort to private format, something that is not original with modernism, as we will shortly see, had a presumably unwanted but not surprising side effect: the inaccessibility that Pinker, for example, complains of.[13]

Downloaded from http://direct.mit.edu/books/book-pdf/2437419/book_9780262356947.pdf by guest on 21 November 2024

A purely cultural account would be forced to treat the parallel inaccessibility of the sister arts as coincidental. After all, it doesn't follow logically that inaccessibility in one of the art forms would produce inaccessibility in another, at least not from a cultural standpoint. But from a cognitive standpoint, it does, if what is being set aside are shared rule systems.

Why do I think it came to this? I think the shared rules were abandoned because artists felt that the rules had been fully explored and overused. It was no longer a challenge to produce a work of art by means of them. Art had become too much of a muchness. This did not mean, of course, that the new art forms fell on deaf ears and dimmed eyes. What it meant was that for the sister arts after modernism, appreciating a work of art became a different process both for the artist and for the audience. The natural, hardwired dispositions of the brain no longer participated unconsciously in the process of creation or appreciation. They were replaced by private formats that had to be worked at to be discovered and appreciated. (I return to a discussion of private formats in chapter 3.)[14]

And while we're on the subject of what my hypothesis does not mean, it also does not mean that all those oceans of ink spilled on cultural, social, economic, and Freudian explanations are irrelevant. I'm sure, for example, that the rise of the bourgeoisie and the presence of workers in Millet's paintings are connected, perhaps even causally. But I do think that those explanations are epiphenomenal. Once the natural rule systems' grip on the sister arts was loosened, they were undoubtedly susceptible to manipulation by the loose-cannoned environment in which they found themselves. Think of it as an immune system that had been compromised.

From my perspective, then, the rules are the *primum movens*, the primary mover. This hypothesis explains why the direction of art went from the accessible to the less so—that is, from the Lascaux cave painters to Rothko rather than from "abstract grids, shapes, dribbles, splashes, and, in the $200,000 painting featured in the recent comedy *Art*, a blank white canvas" to the *Mona Lisa*. It also provides a unified account of what happened to the sister arts in the first place. Art began in the realm of what was natural to the brain.

When the rules were abandoned, not every artist abandoned the rules. After all, today's art forms—the so-called popular arts, jazz, pop music, rap, large swaths of painting, and a great deal of classical music and

Downloaded from http://direct.mit.edu/books/book-pdf/2437419/book_9780262356947.pdf by guest on 21 November 2024

poetry—still avail themselves of the natural aesthetic. Moreover, I do not see that tide dimming. But those for whom the rules had become a Procrustean bed abandoned more than the rules. They abandoned the mainstream. They were the members of a new church expounding a heretical doctrine whose rallying cry was "New rules for old." In painting, in Paris, in 1863, they were, like Manet and his *Déjeuner sur l'herbe* or Whistler and his *Symphony in White, No.1*, the artists who wore as a badge of honor their new name, *Les Refusés*.[15]

There is a second part to my story, one that won't pop up again until the very last chapter. In this instance, last could not be farther from least. For all its modernity, modernism is not in my view a modern phenomenon. In fact, it happened once before. In the last chapter, I note that the Galilean revolution, which initiated what we now think of as modern science, was thrown for a loop by Sir Isaac Newton. The Galileo/Descartes view was that the world must be nothing more nor less than a very intricate mechanism, a clockwork-like machine as Jessica Riskin (2016) admirably demonstrates. The job of the scientist was to figure out what the parts were and how they went together within a testable protocol, the so-called scientific method.

The scientific method survived, but the world as complicated clock did not. Newton showed that objects can influence one another even across vast distances. As no clock worked like that, the clock-like view of the world was unsustainable. Newton himself was unhappy with gravity and spent the rest of his life trying to prove it wrong. It was, for him, a mystery. As he famously said in his "General Scholium" (Newton 1726, 943):

> I have not as yet been able to discover the reason for these properties of gravity from phenomena, and I do not feign hypotheses. For whatever is not deduced from the phenomena must be called a hypothesis.

What has this got to do with modernism? Not to put too fine a point on it, everything. The first thing to ponder is what happened when the rules were abandoned. I have called it a sea change. The change was transformative.

The sister arts no longer reflected the natural bent of shared rules but gave way to a chaos of art forms. For some, this was debilitating. For others, it was an expression of a newfound freedom. For me, it was an indication of a cognitive shift. General intelligence took over from hardwired proclivity. It was a change of mental place, a shift in where problem

Downloaded from http://direct.mit.edu/books/book-pdf/2437419/book_9780262356947.pdf by guest on 21 November 2024

solving was done, whether in making a work of art or coming up with a scientific explanation. That shift in mental activity is what we call modernism. Artists used a different part of the brain to create art. Audiences were forced to play catch-up.

I contend that this was precisely what happened with science in the seventeenth century. The commonsense perception of the world reflected in the mechanistic natural philosophy of the era was abandoned in favor of theories about the world. These theories were not abetted by natural proclivity. They were constructions of general intelligence that became more and more abstract as the years passed, as scientists became more sophisticated and as experimental methods were honed.

What these two events share, at a distance of 200 years, is the shift of mental activity from natural intelligence to general intelligence. The former was based on what the brain did naturally. The latter was based on what practitioners of science and the sister arts made use of when the natural was set aside. In the case of the sciences, the motivating force was Newton. In the case of the arts, it was the perceived exhaustion of shared systems.

With respect to both, I think it is reasonable to say that when the brain came up against its natural limits, it had to resort to a different way of thinking. Doing what comes naturally was moving to the back burner, as it were.

So, the real point of this book is that modernism and post-Newtonian science were both part and parcel of the same thing: the brain relinquishing natural proclivities for the products of general intelligence.

Before we set out on this journey, I need to make an important point. When I talk of the sister arts, my examples will all be Eurocentric. The music will be Western music; the painting will be Western painting; the poetry will be English-language poetry. The reason for this is that the phenomenon I am exploring is a Western phenomenon—namely, what happened to the arts and science of Western civilization when their practitioners abandoned the natural proclivities of the brain.

So, I am exploring a kind of experiment that history has set up. As it happens, the experiment was set up in the West because that's where Galileo, Newton, Descartes, Manet, Cézanne, Van Gogh, et al., were born. Something similar may well have happened elsewhere in the world. Once I've laid out what I think happened, perhaps others will begin to look.

Downloaded from http://direct.mit.edu/books/book-pdf/2437419/book_9780262356947.pdf by guest on 21 November 2024

Downloaded from http://direct.mit.edu/books/book-pdf/2437419/book_9780262356947.pdf by guest on 21 November 2024

2

Christopher, Impossible Rules, and the Mental Life of Modernism

Because the approach taken here is an unfamiliar one, it seems worthwhile to spend some time making the shift I have in mind as explicit as possible. Recall that my thesis is that there exists something called a natural aesthetic, by which I mean an aesthetic that depends crucially on rules based on certain designated functions that the human brain is hardwired to perform. I will provide explicit examples of these rules in what follows. Here it is worth noting only that with the important exception of natural language, rules based on these designated functions are expendable. That is to say, they are available to conscious manipulation in a way that not all rules of natural language are.

For a very long time, these shared rule systems were used to create works of art in poetry, painting, and music. Then they were abandoned. Once that happened, new rules had to be devised. After all, there can be no art form if there are no rules to constrain it. But the new rules, consciously constructed, were a product of general intelligence, not of hardwired predispositions. As such, they reflected systems that the brain isn't naturally predisposed to process—for example, algebra or quantum mechanics. Appreciating art forms based on rules generated by the brain's general intelligence requires effort, just as learning algebra does.

Some relatively recent experimental work in language acquisition bears directly on this question. Basically, this work tests the flexibility of the human brain to come to grips with natural (i.e., possible) and unnatural (i.e., impossible) rule systems.

One striking example (Smith and Tsimpli 1995) involves Christopher, an autistic language savant. I offer it because I think it sheds light on what I argue happened at the dawn of modernism. Christopher had severely impaired general intelligence, but he also had a gift for learning

Downloaded from http://direct.mit.edu/books/book-pdf/2437419/book_9780262356947.pdf by guest on 21 November 2024

languages. Aside from his first language, English, he could speak with some degree of competence Danish, Dutch, Finnish, French, German, Hindi, Italian, Modern Greek, Norwegian, Polish, Portuguese, Russian, Spanish, Swedish, Turkish, and Welsh.

His remarkable ability to learn languages is a natural cognitive function. Everyone is born hardwired to learn a language. Normally developing children cannot help but learn to speak, just as they cannot help but learn to walk, see the world in three dimensions, and digest food. In normally developing human beings, the ability to learn languages begins to shut down at roughly the age of puberty. In Christopher's case the ability never shut off, even though it was coupled with a severely impaired general intelligence.

Given Christopher's mental functioning, linguists Neil Smith and Ianthi-Maria Tsimpli hit upon an interesting experimental idea. They would teach Christopher an artificial language, Epun, which they would simultaneously teach to a control group of linguistics undergraduates. Most of the rules of this language would conform to rules normally found in the languages of the world—subject-verb agreement, plural formation, and the like. Both Christopher and the control group acquired these rules without difficulty. That was to be expected since Christopher and the control group showed no impairment in the part of the brain that acquires language. But now comes the wrinkle. At one point, the experimenters introduced rules that were not linguistically natural; that is, they introduced rules that are never found in natural language. One such rule type has to do with linear counting.

Counting is an easy thing to do. You can count the number of words in this sentence and locate the third word, for example. But it is a remarkable and crucial fact that no known language ever makes use of a rule that involves counting.[1]

A simple example will help make the point, this one drawn from Noam Chomsky's foreword to Moro 2016. Consider the sentence *Instinctively, eagles that fly swim*. The adverb *instinctively* modifies *swim* and not *fly*, even though *instinctively* and *fly* is the more natural pairing. That is to say, the sentence does not mean *Eagles that instinctively fly swim*. It means *Eagles that fly swim instinctively*. From a linear point of view, when the adverb *instinctively* occurs initially, the more natural *fly* is closer than *swim*. But our parsing of the sentence pays no heed to linear distance. What does it attend to?

Downloaded from http://direct.mit.edu/books/book-pdf/2437419/book_9780262356947.pdf by guest on 21 November 2024

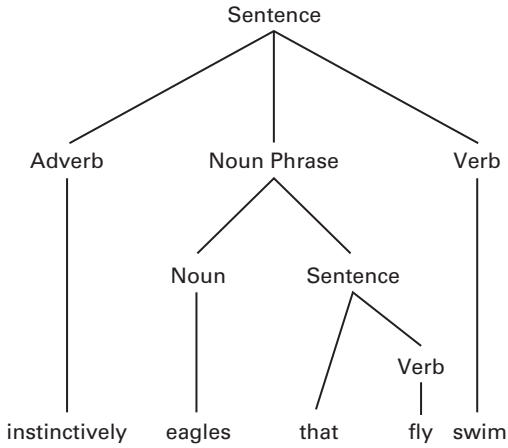


Figure 2.1

Think of the sentence in terms of the way it might be diagrammed (see figure 2.1). If closeness is measured in terms of the number of labeled nodes in this tree (i.e., Sentence, Adverb, Noun Phrase, Verb, Noun) that separate the adverb from the verb that it modifies, then *instinctively* is, indeed, closer to *swim* than to *fly*, as figure 2.2 shows. *Instinctively* is separated from *swim* by only three labeled nodes (dotted line), whereas it is separated from *fly* by five labeled nodes (dashed line).

The kind of relationship illustrated here between *instinctively* and *swim* is called structural dependence. Every language in the world makes use of it. No language, as I've said, ever measures nearness or anything else for that matter in terms of linear counting. But languages do gauge nearness in terms of trees.

With this in mind, Smith and Tsimpli deliberately constructed a rule based on linear counting. They created an emphasis marker, *nog*, and a rule that inserted it after the third orthographic word in a sentence. This was a very simple rule to learn. The plausible assumption was that, despite its easy learnability for normal language learners, this construction would cause Christopher trouble. The area of the brain that acquires language would be of no help since linear counting is not a part of its hardwired tool-kit. Consequently, Christopher would be forced to use general intelligence, precisely the area where he was severely impaired.

Downloaded from http://direct.mit.edu/books/book-pdf/2437419/book_9780262356947.pdf by guest on 21 November 2024

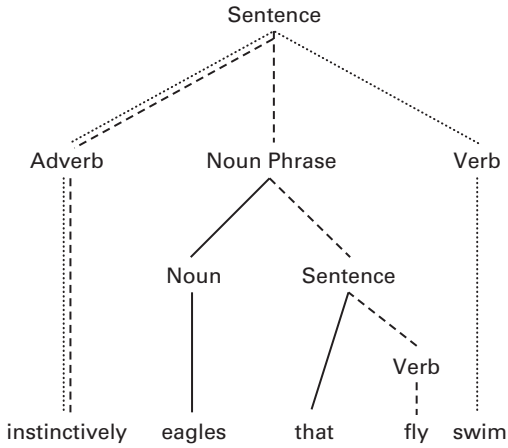


Figure 2.2

The rule governing *nog* is illustrated here, where orthographic words are separated by #:

a.

1		**2**		**3**				**4**
Fa The	#	zaddil-in man	#	ha-bol-u- didn't go	#	**nog**	#	guv. yesterday

b.

1		**2**		**3**		
Lodon-in Lodon	#	ha-bol-u did go	#	guv- yesterday	#	**nog**.

c.

1		**2**		**3**		**4**		**5**		**6**
Chi Who	#	h-u-pat did	#	Lodo-p Lodo	#	**nog**	#	to and	#	mi-za I	#	kakol? see

Remarkably, neither Christopher nor the control group managed to acquire the impossible rule. As Neil Smith emphasizes (personal communication):

> Our hypothesis was indeed that C would fail to induce the rule and that the undergrads by using general intelligence would succeed. Remarkably, none of

Downloaded from http://direct.mit.edu/books/book-pdf/2437419/book_9780262356947.pdf by guest on 21 November 2024

> the undergrads managed to. *In a language-learning context, general intelligence never kicked in*. In other tests the ug's could, but C could not, work out a puzzle requiring identification of the third element.

This is indeed a remarkable result. The simplest explanation for it is this. As long as Epun used "natural" rules, Christopher and the control group were able to learn the language. But if an "impossible" rule was introduced—impossible, that is, from the standpoint of language learning—then neither Christopher nor the control group could learn it. The area of the brain specialized for language learning operated on the assumption that number would never be involved in the task at hand—that is, learning a language. Hence, it would never offer a hypothesis about a grammatical rule that depended on number. As far as it was concerned, that was a non sequitur. Number-related problems required that attention go elsewhere in the brain, namely, to general intelligence. When Smith and Tsimpli presented Christopher and the control group with puzzles involving counting (i.e., a third element), the control group solved the puzzle. However, because his general intelligence was impaired, Christopher was unable to.

When Smith and Tsimpli performed their experiment, fMRI brain-imaging techniques were not available to them. Subsequently, a number of researchers including Andrea Moro (2016) have performed similar experiments during which they measured activity in Broca's area, a section of the brain specific to language production. These experiments did not involve autistic participants. Rather, Moro worked with Italian, German, and Japanese speakers and taught each of them versions of a language they did not know. In Moro 2016, he reports on one experiment in which eight German-speaking subjects, four men and four women, all right-handed, all having been exposed only to their native language, were taught a version of Italian with both possible and impossible rules. The results of the experiment were identical to Smith and Tsimpli's, but with the added benefit that fMRI mapping allowed brain activity to be observed while participants worked on their tasks. When they were asked to judge the grammaticality of sentences constructed with possible rules, Broca's area showed heightened activity. But when they were asked to judge the grammaticality of sentences constructed with impossible rules, activity in Broca's area diminished. Here is Moro's summary of the results (2016, 162–164):

Downloaded from http://direct.mit.edu/books/book-pdf/2437419/book_9780262356947.pdf by guest on 21 November 2024

> The brain has "sorted out" the syntactic data, without the subjects' realizing it: Broca's area, which is included in the network that is naturally predisposed for syntactic tasks, has been progressively activated when processing rules that respected structure dependency while it has been progressively deactivated when processing sentences that did not.

Let's put these results in the context of the thesis of this book. Prior to the onset of modernism, enjoying a work of one of the sister arts was like Christopher learning a natural language or the participants in Moro's experiment learning a new language with possible rules. The architecture of the brain offered a leg up in its shared hypotheses about what was going on. But once the natural rules associated with the sister arts were abandoned, their audiences were confronted with a different task altogether, one where the brain could no longer help "sort out" the data naturally. Since, as I've suggested, artists turned to private formats, the natural predispositions of the brain were of no help. General intelligence was the only recourse.

This doesn't mean that viewers wouldn't get pleasure from art forms based on "unnatural" rules. It only means that acquiring that pleasure was no longer aided and abetted by the natural predispositions of the brain. The passing years have shown that for more and more people, the game was not worth the candle. "Modernist" artists constructed their art in accordance with private—that is, unshared, unnatural (in my special sense)—formats. The audience was required to fathom these private formats. In many instances they resorted to, to borrow a modern metaphor, the Easter egg—not as in "hunt," but as in "computer software." I intend to show that the Easter egg was a marginal construct in art before modernism. In the modernist and postmodernist eras, it became the very center of the art form. At this point, let us take a closer look at art and Easter eggs in the intended sense.

Downloaded from http://direct.mit.edu/books/book-pdf/2437419/book_9780262356947.pdf by guest on 21 November 2024

3

Private Format as Easter Eggs

The software Easter egg is a hidden message inside a computer program that is not essential to the program but, if found, can be anything from amusing to enlightening to empowering. This use of the term *Easter egg* arose because of a secret message encoded in *Adventure*, a 1979 video game released by Atari. It was discovered in 1980 when a 15-year-old player accidentally moved his avatar over a single pixel (the "Gray Dot") in a certain part of the game. The move triggered a message: "Created by Warren Robinett." It was Robinett's way of getting back at Atari for not allowing him to be credited with the design of the game. Atari was afraid he would be lured away by competitors. The effort failed. By the time the Easter egg was discovered, he was gone. The director of software development at Atari, Steve Wright, decided that rather than reprogramming the game, it would be better to encourage the whole idea. He came up with the phrase "Easter egg."

I see the Easter egg as a useful metaphor for what I am about to discuss. It is a hidden structure implanted inside a work of art that is there to be discovered but is not essential to the act of appreciation. "Easter egg" is just another name for "private format." The device is at least 500 years old and very likely much older.[1] Here is an example of a modern Easter egg.[2]

The sphinx, or death's-head hawkmoth, plays a role in the book *Silence of the Lambs*. In the famous poster advertising the film version (see figure 3.1), the artist has inserted an Easter egg in the form of the death's-head pattern on the back of the moth.

It is more than just a drawing, however. It is, in fact, a severely reduced representation of a Salvador Dali tableau vivant done in collaboration with the photographer Philippe Halsman (see figure 3.2). The nature of the collaboration is described in this passage from Halsman 1972, 178:

Downloaded from http://direct.mit.edu/books/book-pdf/2437419/book_9780262356947.pdf by guest on 21 November 2024

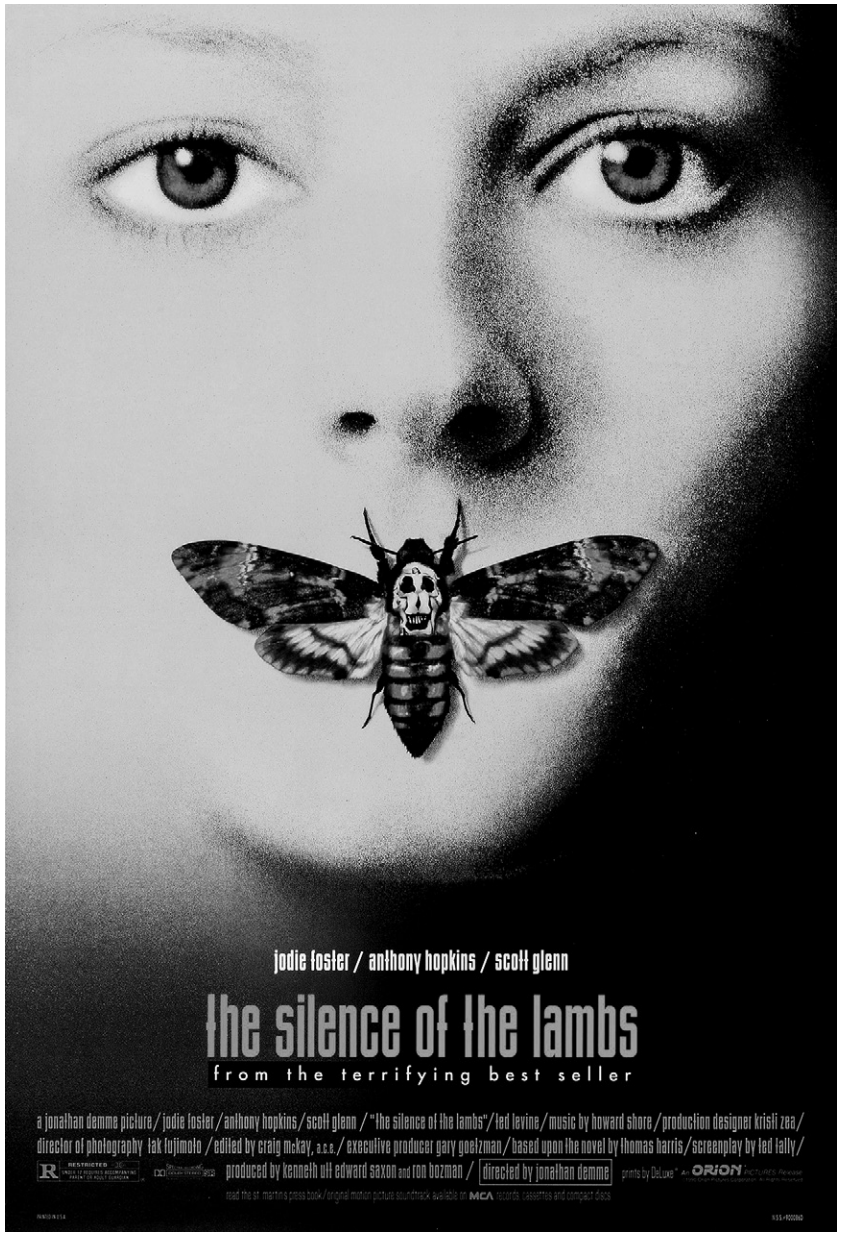

jodie foster / anthony hopkins / scott glenn
the silence of the lambs
from the terrifying best seller
a jonathan demme picture / jodie foster / anthony hopkins / scott glenn / "the silence of the lambs" / tad levine / music by howard shore / production designer kristi zea / director of photography tak fujimoto / edited by craig mckay, a.c.e. / executive producer gary goetzman / based upon the novel by thomas harris / screenplay by ted tally /
produced by kenneth utt edward saxon and ron bozman / directed by jonathan demme
prints by DeLuxe
ORION PICTURES Release
read the st. martins press book / original motion picture soundtrack available on MCA records, cassettes and compact discs

Figure 3.1
Poster advertising the movie *The Silence of the Lambs*

Downloaded from http://direct.mit.edu/books/book-pdf/2437419/book_9780262356947.pdf by guest on 21 November 2024

Figure 3.2
Philippe Halsman, *In Voluptate Mors*, 1951. Photograph incorporated into *The Silence of the Lambs* movie poster.

[A] European publisher proposed making a book composed of my Dali photographs. Dali and I decided that among them should also be a photograph of a nude. I thought of overwhelming the public with the sheer number of nudes and suggested, "Maybe we should try to do a temptation of St. Anthony."

"No," answered Dali, "it has already been done to death."

The next day, however, Dali phoned and told me that my suggestion had inspired him to draw a skull composed of seven nudes. "In voluptuousness there is always the idea of death," he explained. The drawing was beautiful but to execute it with real women presented quite an engineering problem for me and my assistant. The casting took two weeks because everything depended on the right proportions of the girls.

Downloaded from http://direct.mit.edu/books/book-pdf/2437419/book_9780262356947.pdf by guest on 21 November 2024

Using the reduced image of the Dali/Halsman collaboration was probably the idea of the film's director, Jonathan Demme. Whoever's idea it was, it did not please members of the Halsman estate, one of whom wrote me the following email:

> You should know that the usage was unauthorised. Given the nature of the film being about a psychopathic woman hating serial murderer, we do not appreciate being associated with such content. The Halsman Dali collaboration "In Voluptate Mors" (1951) was about the temptation of Saint Anthony and his struggle with transcending the desire for flesh during his awakening in the desert.[3]

You don't need to know any of that to enjoy the hidden surprise that comes with realizing that the image on the back of the moth was put there not by nature but by a human hand. For the artist who put it there, it is a kind of private joke between him or her and the viewer who gets it. That said, the evident distaste of the Halsman estate is not misdirected. It is highly likely that the image was secretly inserted because it was redolent of the morbid themes of the book and movie.[4]

Lindon Leader, the designer of the famous FedEx logo with its hidden-arrow Easter egg (see figure 3.3), explained the role of the Easter egg in an interview with *The Sneeze* (www.thesneeze.com):

> The power of the hidden arrow is simply that it is a "hidden bonus." It is a positive-reverse optical kind of thing: either you see it or you don't. Importantly, not "getting the punch line" by not seeing the arrow, does not reduce the impact of the logo's essential communication. … On the other hand, if you do see the arrow, or someone points it out to you, you won't forget it. I can't tell you how many people have told me how much fun they have asking others "if they can spot 'something' in the logo." To have filled in the arrow, or to somehow make it more "visible" would have been like Henny Youngman

Figure 3.3
FedEx logo

Downloaded from http://direct.mit.edu/books/book-pdf/2437419/book_9780262356947.pdf by guest on 21 November 2024

> saying "Please take my wife" instead of "Take my wife. Please." Punch lines that need to be explained are neither funny nor memorable.

This is as good an explanation of the role of the Easter egg from an actual Easter egg layer as you are likely to find.[5]

The use of Easter eggs is by no means a twentieth-century invention. The fourteenth-century French composer and poet Guillaume de Machaut wrote and set to music a poem entitled "Ma fin est mon commencement" (My end is my beginning). The English translation is from Virginia Newes (1990, 226).

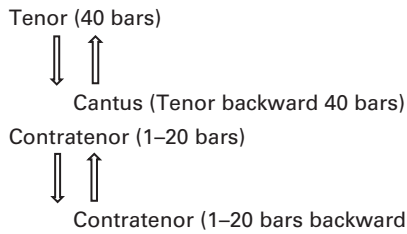
1. Ma fin est mon commencement	My end is my beginning
2. Et mon commencement ma fin	And my beginning my end.
3. Et teneure vraiement	And the tenor [is sung] in the normal way
4. Ma fin est mon commencement.	My end is my beginning.
5. Mes tiers chans trois fois seulement	My third voice three times only
6. Se retrograde et einsi fin.	Turns back on itself and thus ends.
7. Ma fin est mon commencement	My end is my beginning
8. Et mon commencement ma fin.	And my beginning my end.

The poem, together with its musical setting, appears in figure 3.4.[6]

Newes's translation underscores that the poem is a roadmap for the music in the way that a treasure map leads to a pot of gold (1990, 226):

> The refrain text, 'Ma fin est mon commencement, et mon commencement ma fin', is the clue to the retrograde realization of the cantus. The third line of the text, 'et teneure vraiement', tells us that the tenor has to read the principal melody in the normal way; 'mes tiers chans' in line 5 must therefore refer to the contratenor. Only the tenor is written out in full; the cantus has to be realized by reading the tenor backwards, while the B section of the contratenor also has to be supplied by repeating the A section in retrograde. The correct realization of Machaut's retrograde rondeau thus requires both the complete text, which serves as its canonic rubric, and correct labelling of the voices.

The musical reversals she describes can be diagrammed as follows:



Downloaded from http://direct.mit.edu/books/book-pdf/2437419/book_9780262356947.pdf by guest on 21 November 2024

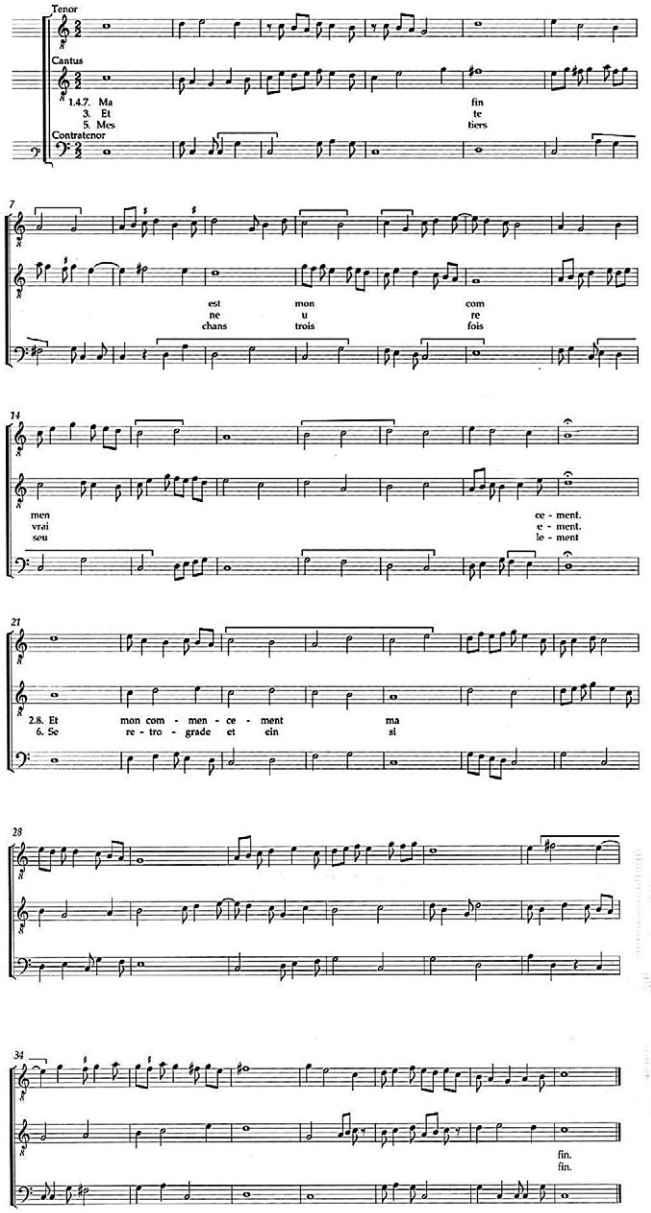
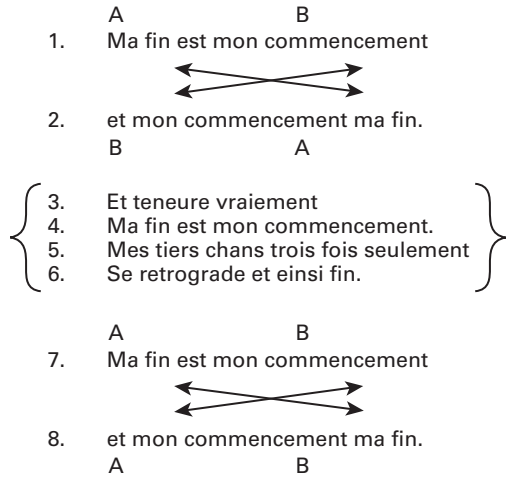



Figure 3.4
"Ma fin est mon commencement": poem and musical setting. From a compendium by Leo Schrade, editor, *Polyphonic Music of the Fourteenth Century.* Volumes II–III: *The Works of Guillaume de Machaut.* Éditions de L'Oiseau-Lyre, Monaco, 1956. Reproduced with permission from Éditions de L'Oiseau Lyre, University of Melbourne.

Downloaded from http://direct.mit.edu/books/book-pdf/2437419/book_9780262356947.pdf by guest on 21 November 2024

And here is a diagram of the poem:


A B
1. Ma fin est mon commencement
2. et mon commencement ma fin.
B A
3. Et teneure vraiement
4. Ma fin est mon commencement.
5. Mes tiers chans trois fois seulement
6. Se retrograde et einsi fin.
A B
7. Ma fin est mon commencement
8. et mon commencement ma fin.
A B

Obviously, Machaut wanted the structure of the poem to be reflected in the structure of the music. Lines 1 and 2 and lines 7 and 8 reverse one another, the rhetorical device of chiasmus mentioned in the preface.[7] The chiasmatic sequence is "ma fin … mon commencement—mon commencement … ma fin." The tenor cantus and the "contratenor (A)-contratenor (B)" retrogrades reflect the poem's chiasmus.

However, the structure of the poem/musical composition goes beyond chiasmus. The middle couplets are literally instructions on how to perform the piece. Line 3 indicates that the 40-bar tenor part is straightforward. As a jazz musician might say, "You play the ink." Line 4 alludes to the construction of the cantus: namely, you play the ink, only backward. Lines 5 and 6 tell the reader that the third voice is also a retrograde and is to be repeated three times:

> My third voice three times only
> Turns back on itself and thus ends.

To understand why "three times," we need to look at the rhyme scheme of the poem: ABaAabAB. The capitalized letters indicate the refrain: A = *Ma fin est mon commencement* and B = *et mon commencement ma fin*. In the rhyme scheme, B/b appears three times—hence the instruction that the third voice is to be repeated three times.

From the composer's point of view, putting all this together is not easy. From the listener's point of view, putting all this together is impossible.

Downloaded from http://direct.mit.edu/books/book-pdf/2437419/book_9780262356947.pdf by guest on 21 November 2024

Reversing the tenor to get the cantus and reversing the contratenor starting at bar 21 makes it virtually impossible to unravel the course of the composition, unless of course you have the mind of a Mozart. The average human brain simply doesn't have enough short-term memory to keep track.

Machaut's retrograde rondeau qualifies as an Easter egg par excellence. This format is private because only the composer knows it is there. Presumably, the composer doesn't care whether the listener gets it or not.[8] Moreover, its existence will have no effect whatsoever on how the rondeau is sung.

One can speculate why a composer would do such a thing. It is clear that Machaut wanted the structure of the musical composition and the structure of the poem to reflect one another. That both are marked by reversed structure is no coincidence. But why Machaut undertook such a task remains shrouded. Leader's explanation is as good as any. It is a "hidden bonus." Whatever the reason, the important point to keep in mind is that the retrograde structure of the music is a purely private artifice.

Now let us look at a Middle English translation of a ballad by the French poet Oton de Granson. The translator is Geoffrey Chaucer, and the translation appears in the latter's *The Complaynt of Venus and Mars*.[9] Here is a portion of Granson's ballad, with Chaucer's version on the right:

1. Certes, Amour c'est chose convenable	Now certis, Love, hit is right covenable
2. Que vos grans biens faciez comparer:	That men ful dere abye thy nobil thing,
3. Veillier ou lit et jeuner a la table,	As wake abedde, and fasten at the table,
4. Rire en plorant et en plaignant chanter	Wepinge to laughe, and singe in compleynyng,
5. Baissier les yeulx quant on doit regarder,	And doun to caste visage and lokyng,
6. Souvent changier couleur et contenance,	Often to chaunge hewe and contenaunce,
7. Plaindre en dormant et songier a la dance,	Pleyne in slepyng, and dremen at the daunce,
8. Tout a rebours de ce qu'on vuelt trouver.	Al the reverse of any glad felyng.

Chaucer transformed Oton de Granson's 10-syllable-long line into a 10-syllable-long syllabotonic line where word stresses are distributed

Downloaded from http://direct.mit.edu/books/book-pdf/2437419/book_9780262356947.pdf by guest on 21 November 2024

iambically according to a specific set of metrical rules. (I will return to these rules shortly.)

The reason these lines are of interest is that Chaucer hid an Easter egg in them. He translated a portion of Granson's verse so that its morphology reflects the reversal motif of Granson's original—namely, that love turns everything upside down. It reverses normal reactions so that the lover cries when he should be laughing, fasts when he should be eating, and so on.

Let us look at lines 4–7 of his translation to see how this works.

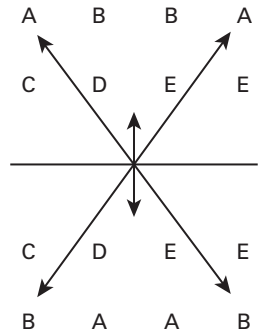
4.			
Wepinge gerund + -ing A	to laughe, infinitive B	and singe infinitive B	in compleynyng, gerund + -ing A
5.			
And doun adverb C	to caste infinitive D	visage noun E	and lokyng noun E
6.			
Often adverb C	to chaunge infinitive D	hewe noun E	and contenaunce noun E
7.			
Pleyne infinitive B	in slepyng, gerund + -ing A	and dremen gerund + -ing A	at the daunce, noun B

Chaucer, like Granson, chose morphology to reflect the theme of reversal. However, Chaucer enhanced the pattern. He translated the line pair 5–6 so that the two lines are morphologically parallel, unlike the original:

5. Baissier les yeulx quant on doit regarder,	[And doun] to caste visage and lokyng,
6. Souvent changier couleur et contenance,	[Often] to chaunge hewe and contenaunce,

Downloaded from http://direct.mit.edu/books/book-pdf/2437419/book_9780262356947.pdf by guest on 21 November 2024

The result is a quatrain that is a mirror image morphologically in the vertical as well as in the horizontal plane, as the following diagram illustrates:



Machaut mirrored his poem musically. Chaucer did it morphologically. Abstractly, the two examples are identical.[10] The use of chiasmus in this translation is strictly idiosyncratic and private in the sense that the poet is unconcerned with whether the reader gets it or not. It is another Easter egg.[11]

Hunting for Easter eggs in premodernist works of art is fun. When you find one, you get that thrill of discovery. It is as if you've won the lottery—well, sort of. But once you come to postmodernist works of art, finding the Easter egg is the name of the game. What is this painter trying to show me? What is this poet getting at? I don't get this music. These are the questions posed by painters like Jackson Pollock, poets like John Ashbery and Wallace Stevens, and composers like Arnold Schoenberg. As we will see later on, what they have to say doesn't jump out at you. You have to hunt for it. In other words, when confronted with premodernist works of art, when it comes to hunting, you can take it or leave it, but for postmodernist works, there is no help for it. You are on an Easter egg hunt whether you like it or not.

The problem is that just as there isn't a pot of gold at the end of every rainbow, so, too, not every Easter egg hunt will lead to an Easter egg. The reason might be that there isn't an Easter egg to be found. Or it might be that the Easter egg is so private that finding it is well-nigh impossible.

Later, I discuss works of art where the Easter egg is well-hidden but ultimately detectable, works by Schoenberg, Stevens, and Pollock. I also discuss works where the format is so private that the egg is simply

Downloaded from http://direct.mit.edu/books/book-pdf/2437419/book_9780262356947.pdf by guest on 21 November 2024

inaccessible. Here I turn to Ashbery's poetry for illustration. His work is of special interest because it has led to a critical approach to poetry that makes a virtue of inaccessibility. For poetry of this sort, the hunt is the thing. Poetry of this sort challenges the reader to insert an Easter egg where there doesn't appear to be one. Much literary criticism surrounding this kind of Ashbery-inaccessible poetry comes down to the question of whose Easter egg is best.

That postmodernist artists abandoned shared formats doesn't mean that they didn't hit upon new art forms based on formats that are also privileged (i.e., hardwired) but were not previously made use of. As we will see, Stevens and Pollock offer examples of this. We will also encounter private formats that could not conceivably be hardwired—for example, when we come to Schoenberg.[12]

Downloaded from http://direct.mit.edu/books/book-pdf/2437419/book_9780262356947.pdf by guest on 21 November 2024

Downloaded from http://direct.mit.edu/books/book-pdf/2437419/book_9780262356947.pdf by guest on 21 November 2024

4

The Need for Rules

Creating art has much in common with playing games. Both need rules. Without rules, there can be no game, and, as we will see, no art. Imagine a group of people going out onto a field to play a game, only to discover that there are no rules. Perhaps they will mill about. Sooner or later they will go home. Either that or they might make up rules. If the rules are ingenious enough, the possibilities can be endless.

Think of chess, a game of 32 pieces and a board divided into 64 equal-sized squares. The pieces move in prescribed ways, the pawns one square at a time, the bishops along the diagonal, the rooks (like Balinese evil spirits) only in straight lines, and so forth. One estimate is that in a typical chess game of, say, 40 moves, more different games are possible than there are atoms in the universe, a remarkable degree of freedom within a highly constrained system. Rules do not diminish creativity. They make it possible.

This is not news. In a discussion of free verse, T. S. Eliot (1965, 34–35) observed, "[F]reedom is only truly freedom when it appears against the background of an artificial limitation."

With respect to poetry, the most obvious rule system governs so-called metrical behavior, the rules that prescribe how syllables must be arranged in a line of poetry. Metrical poetry goes back a long way. In English, its history spans the period from *Beowulf* (roughly seventh century) through Robert Frost, Robert Lowell, and the metrical poems of Wallace Stevens, to name just a few. There have been departures from metricality.[1] But metered verse dominated the language until the twentieth century. And of course poets still resort to it, though much less often.

Artists have always placed a great deal of emphasis on the notion of freedom; what they haven't always been clear about is what freedom

Downloaded from http://direct.mit.edu/books/book-pdf/2437419/book_9780262356947.pdf by guest on 21 November 2024

means to them as artists. Victor Hugo, in the preface to his collection of poems *Les orientales*, declares freedom a necessary condition for poetry:[2]

> The author of this collection is not one of those who cede to the critic the right to question the poet about his fantasy, and to ask him why he chose such and such a subject. … There are neither good nor bad subjects in poetry, only good and bad poets. Besides, everything is a subject; art encompasses everything; everything has the right to be cited in poetry. Let us not ask, therefore, about the motive that has made you take up this subject, sad or gay, horrible or graceful, brilliant or somber, strange or familiar, rather than some other. Let us examine how you have worked, not on what subject and why. [My translation]

But, of course, he is espousing freedom of subject matter, not freedom from metrical constraint. Indeed, in *Les orientales* Hugo practiced a variety of French meters. He did not, as Frost put it, play tennis without a net.

Perhaps no creative artist put the case for constraints more eloquently than Igor Stravinsky. In 1947, he delivered the Charles Eliot Norton lectures at Harvard University, in the form of six lessons. The third lesson, entitled "The Composition of Music," ends with this comment from Baudelaire (Stravinsky 1947, 63–65):

> "It is evident," writes Baudelaire, "that rhetorics and prosodies are not arbitrarily invented tyrannies, but a collection of rules demanded by the very organization of the spiritual being, and never have prosodies and rhetorics kept originality from fully manifesting itself. The contrary, that is to say, that they have aided the flowering of originality, would be infinitely more true."

Baudelaire was not steadfast, however. Three years later, he wrote in a letter to a friend:

> Who among us has not dreamed, in his ambitious days, of the miracle of a poetic prose, musical without rhythm or rhyme, supple enough and jarring enough to be adapted to the soul's lyrical movements, to the undulations of reverie, to the twists and turns that consciousness takes?[3]

As we will see, Ezra Pound followed the later Baudelaire in his exhortation in *The Cantos* to "break the pentameter." It seems appropriate, then, to spend some time looking at the actual rules that constrained the sister arts. We begin with metrical poetry.

Downloaded from http://direct.mit.edu/books/book-pdf/2437419/book_9780262356947.pdf by guest on 21 November 2024

5

"Meaning isn't everything … but it is something, dammit"

The rule systems at work in poetry are many. For one thing, there is a rule system that corresponds to knowledge of the language in which the poem is written. On top of that, there is a rule system that governs the metrical behavior of the poem, including rhyme. Metrical rules and rules governing when two words rhyme are the ones we will explore in some detail here. But poetry goes beyond these systems. As far back as written poetry in English goes, it has been metrical and has rhymed, either through alliteration in Anglo-Saxon poetry or through end rhyme of the sort that characterized Chaucer's Middle English in, for example, *The Canterbury Tales*. Being denuded of these devices was a critical change in poetry at the turn of the twentieth century. When this happened, the question of what the poem meant took center stage.

Before we look specifically at the metrical and rhyming rules of English, let us consider two poems. The first—"San Sepolcro" by Jorie Graham, one of America's most influential poets—is a twentieth-century poem that demands we pay attention to its meaning. The second is "To His Coy Mistress" by Andrew Marvell, the seventeenth-century metaphysical poet, a friend and colleague of John Milton.

Here are the first lines of each:

San Sepolcro

In this blue light
    I can take you there,
snow having made me
    a world of bone
        seen through to.

To His Coy Mistress

Had we but world enough and time,
This coyness, lady, were no crime.

Downloaded from http://direct.mit.edu/books/book-pdf/2437419/book_9780262356947.pdf by guest on 21 November 2024

Graham's poem is unrhymed and without meter. We see only varying line lengths and the words. Marvell's is written in rhymed iambic tetrameter couplets. But that is not the only difference.

The opening of "San Sepolcro" raises questions, more than anything else. Why is the light blue? Where is the "there" that "you" can be taken to? Who is the "I" who is going to take "you" to wherever "there" is? What is the function of "me" in the phrase "made me a world of bone seen through to"? Is it benefactive? That is, are we to understand the "me" to mean "for me" and that snow made "a world of bone seen through to" for "me," the "I" of the second line? Or does the poem mean that "I/me" has actually been made into a world of bone that one can see through to? The use of "having" seems to suggest that in either case being made into "a world of bone seen through to" enables the "I" to take the "you" there, wherever "there" is. How did snow do that? And, anyway, what does that mean?

Perhaps "a world of bone" is meant to be a way of talking about a skeleton, a way of saying that the narrator is dead. But if snow made the narrator into a world of bone (i.e., dead), does that mean the narrator froze to death? In San Sepolcro? Where it rarely if ever goes below freezing? And in any case, why should a skeleton having been made such by snow now be in a position to take anyone there, wherever "there" is? Maybe "*a world of bone*" doesn't refer to a skeleton. But then what does "a world of bone seen through to" mean and why should I, the reader, have to struggle so to figure that out?

If we knew who "I" was, perhaps that would shed some light on the mysteriousness of that opening sentence. But we don't know. At this point, at least, the opening sentence appears to be a purely private moment between the poem and its poet. Overwhelmed by a series of unanswered questions that push the poem farther and farther back into the shadows of inaccessibility, many readers come to feel more like intruders than guests, throw up their hands and say, "To hell with it." Others are piqued by the challenge. They want to figure out what's going on. Those readers have their work cut out for them.

Now look, by way of comparison, at Marvell's opening line. It rhymes. It is metrical. And its meaning is crystal clear. We are being let in on a seduction, pure and simple. None of the mystery of "San Sepolcro" here.

Downloaded from http://direct.mit.edu/books/book-pdf/2437419/book_9780262356947.pdf by guest on 21 November 2024

It is a fact that a great deal, though not all, of modern poetry raises the same questions of accessibility that "San Sepolcro" does while most pre-twentieth-century poetry is, comparatively speaking, transparent. It is also true that modern poetry has shed most of the constraints that earlier poetry followed so slavishly—that is, meter and rhyme. In fact, the only constraint the two bodies of poetry share is a minimal metrical unit, the line.

This raises a question: Is there a correlation between accessibility and traditional (i.e., natural) constraints? Accessibility is entirely a matter of meaning. Inaccessible poetry forces the reader to engage in the exercise of figuring out what the poet is getting at, an exercise that dominates the reading of much contemporary poetry.

The issue is at the heart of a poem by Billy Collins, "Introduction to Poetry." Collins, a contemporary poet known for his wit, intelligence, and accessibility, deals with the search for meaning by denying that it is a reasonable thing to ask of a poem. He begins:

> I ask them to take a poem
> and hold it up to the light
> like a color slide

After going through several other "asking them" scenarios—listening to the poem's "hive," dropping a mouse inside the poem and watching it find its way out, walking inside the poem's room and feeling for the light switch, waterskiing across the surface of the poem while waving at the author's name on the shore—he ends chidingly:

> But all they want to do
> is tie the poem to a chair with rope
> and torture a confession out of it.
>
> They begin beating it with a hose
> to find out what it really means.

From Collins's point of view, that's just what I've been doing with the opening lines of "San Sepolcro." I've been torturing the hapless poem. What should I have been doing? For Collins, a poem is something that one should experience rather than interpret. You can look at it, listen to it, imagine being inside it as if it were a three-dimensional object, but whatever you do, don't ask what it means. That is tantamount to poetic torture.

Downloaded from http://direct.mit.edu/books/book-pdf/2437419/book_9780262356947.pdf by guest on 21 November 2024

This is an appeal to treat poetry as if it were music, or, as August Wilhelm Schlegel might have it, to reduce poetry to music. Writ large, this point of view says that when poetry gave up natural constraints, the poem shifted from being an object that means something to an object that engages all your senses except the one that thinks about what the words actually mean.

The following comment captures some of the frustration in trying to come to grips with the evident inaccessibility of much modern poetry. It appeared in a November 27, 1994, review in the *Boston Globe*. Critic Geoffrey Stokes wrote:

> Meaning isn't everything—as Wallace Stevens once not unkindly wrote to a reader who'd asked him about the meaning of a particular piece—but it is something, dammit.

Stevens was replying to 26-year-old Anna Wirtz, who was puzzled by the meaning of his poem "The Emperor of Ice-Cream." "Do you mean," she wrote, "that so many things in life are ugly and disillusioning and that the only sure beauty is that of 'concupiscent curds' of ice cream? You speak of so many imperfect things and then place ice cream as ruler over all." Stevens's "not unkindly" reply reads:

> Dear Miss Wirtz:
> Some time ago I made up my mind not to explain poems, because the meaning of a poem is really one part of it.
>
> Of course, I never meant that ice cream is, for good and all, the *summum bonum*. If the meaning of a poem is its essential characteristic, people would be putting themselves to a lot of trouble about nothing to set the meaning in a poetic form.
>
> Very truly yours,
> Wallace Stevens

It certainly sounds as if Collins and Stevens are on the same page: namely, whatever is at the heart of a poem, it isn't meaning.

I was sympathetic to the frustration in Stokes's comment. If form has been reduced to a mere shadow of its former self—that is, no rhyme, no meter, no alliteration—then what is left but meaning? And here we have a major poet, perhaps the major poet of the twentieth century, asserting that meaning isn't everything. So, what is he referring to? Well, since the shared forms of meter and rhyme have been jettisoned, what is left must be some private form that, like a software Easter egg, the poet has hidden in the poem.

Downloaded from http://direct.mit.edu/books/book-pdf/2437419/book_9780262356947.pdf by guest on 21 November 2024

Explanations of "The Emperor of Ice-Cream" make precious little use of the formal aspects of the poem. It is written in free verse with line lengths varying between 7 and 14 syllables; each stanza is 8 lines long. The closing couplet of the first stanza rhymes and the closing quatrain of the second stanza rhymes. So what? one might well ask.

There are suggestive parallels. The penultimate line of the first stanza is *Let be be finale of seem*. The penultimate line of the second stanza is *Let the lamp affix its beam*. *Beam* contains the word *be*. Perhaps it is meant to be a portmanteau of *be* and *seem*. One might certainly conjecture something along the lines that human existence is a combination of *be* and *seem* scrunched together in the single word *beam*. The compound noun *ice-cream* is similarly double-edged. It contains the separate words *ice* and *cream*. The former characterizes the feeling tone of the second stanza; the latter, that of the first stanza. So, combining two items, phonological in *be* + *seem* to produce *beam* and morphological in *ice* + *cream* to produce *ice-cream*, might be viewed as reflecting the poem's content in its form. But there is nothing shared about these reflections. A critic has to develop them and then publicize them in a classroom or an article. That is, the critic has to hypothesize what the private format of the poem consists of, and even then, there is no guarantee the critic has it right. And the poet isn't much help. As Stevens said, he gave up explaining his poems along ago. No wonder Miss Wirtz was puzzled.

But is this just about hidden form and hidden content? I don't think so. I think something deeper is at work here. Noam Chomsky (2009, 61) calls attention to Schlegel's (1801, 145) view of the close affinity between the creative aspect of language and artistic creativity more generally:

> Schlegel describes language as "the most marvelous creation of the poetic faculty of the human being."

Schlegel asserts a dichotomy between language and the "poetic faculty" that gave rise to it. Chomsky (2009, 61) expands on the idea:

> But it is interesting to trace, in slightly greater detail, the argument by which Schlegel goes on to relate what we have called the creative aspect of language use to true creativity. Art, like language, is unbounded in its expressive potentiality.[1] But, Schlegel argues, poetry has a unique status among the arts in this respect; it, in a sense, underlies all the others and stands as the fundamental and typical art form. We recognize this unique status when we use the term "poetical" to refer to the quality of true imaginative creation in any of the arts. The explanation for the central position of poetry lies in its association with

Downloaded from http://direct.mit.edu/books/book-pdf/2437419/book_9780262356947.pdf by guest on 21 November 2024

> language. Poetry is unique in that its very medium is unbounded and free; that is, its medium, language, is a system with unbounded innovative potentialities for the formation and expression of ideas. The production of any work of art is preceded by a creative mental act for which the means are provided by language. *Thus the creative use of language, which, under certain conditions of form and organization, constitutes poetry* [Schlegel 1801, 231], *accompanies and underlies any act of the creative imagination, no matter what the medium in which it is realized* [italics mine]. In this way, poetry achieves its unique status among the arts, and artistic creativity is related to the creative aspect of language use.

The import of this view is that the creative use of language when subjected to certain conditions—for example, metrical and rhyming conventions—constitutes poetry. Take away the constraints and one can still ask: Where is the poetry? This is Schlegel's response (from Chomsky 2009, 103n34):

> In poetry the expressive potentiality that is found in the arts is found to an even higher degree since other arts do after all have in light of their restricted media or means of representation [*Darstellung*] a determinate sphere of activity that could allow itself to be circumscribed to some degree. The medium of poetry is precisely the medium through which the human spirit awakens to itself at all, and through which it fastens on to its presentations [*Vorstellungen*] in arbitrary associations and expressions—that is, language. Poetry is therefore not even bound to objects, it rather makes its own object for itself; it is the most comprehensive of all the arts and is, as it were, the omnipresent universal spirit in them. That which, in the representations of the remaining arts raises us up out of everyday reality into a world of fantasy, is called their poetical element. Poetry therefore designates in this general sense artistic invention, the wondrous act whereby it enriches nature; as its name asserts, it is a true creation and bringing forth. Every outward material representation is preceded by an idea in the mind of the artist in which language always comes into play as the mediator of awareness; consequently one can say that they always emerge from the womb of poetry. Language is not a product of nature, rather it is an imprint [*Abdruck*] of the human mind which exhibits the emergence and connections of its presentations as well as the operating mechanism [of the human mind]. Thus in poetry what has already taken shape is given shape again, and its plasticity is just as limitless as spirit's ability to turn back on itself in reflections of ever-increasing potentialities. [Brackets are Chomsky's.]

When Schlegel writes:

> That which, in the representations of the remaining arts raises us up out of everyday reality into a world of fantasy, is called their poetical element. Poetry therefore designates in this general sense artistic invention, the wondrous act whereby it enriches nature; as its name asserts, it is a true creation and bringing forth.

Downloaded from http://direct.mit.edu/books/book-pdf/2437419/book_9780262356947.pdf by guest on 21 November 2024

he is distinguishing between two kinds of "poetry," one with a capital P and one with a lowercase p. In his view, capitalized Poetry is the quintessentially creative aspect of human nature. This is what he means when he says "as its name asserts." He is doubtless thinking of the origin of the word: Greek *ποεῖν*, *ποιεῖν* 'to make, create, produce; to compose, write'. This sense is captured in the OED's entry:

> In extended use: creative or imaginative art in general. Cf. poet *n.* 3b. *Obs.*
>
> 1815 D. Stewart in *Encycl. Brit., Suppl.* I. 5 (*note*) The latitude given by D'Alembert to the meaning of the word *Poetry* is a real and very important improvement on Bacon, who restricts it to fictitious History or Fables … D'Alembert, on the other hand, employs it in its natural signification, as synonymous with *invention* or *creation*.

Lowercase poetry, on the other hand, is the expression of Poetry "under certain conditions of form and organization." Capitalized Poetry accompanies and underlies any act of the creative imagination, no matter what medium it is realized in. But subject it to constraints (rhyme and meter) and it becomes (lowercase) poetry.

The obscurity and inaccessibility of much modern poetry, then, can be attributed to its attempt to represent the Poetic mind of the poet, a representation that by definition cannot be mediated by a common bond of shared rules. The phrase *snow having made me a world of bone seen through to* is one of Schlegel's "arbitrary associations and expressions [that is] not even bound to objects, it rather makes its own object for itself."[2]

Understanding modern poetry like Graham's, then, is either a matter of pure chance—the reader happened to have made the same association at some point in time—or a matter of intellectual digging—the reader has been exposed to and engaged with this poet's work over a long period of time, either alone or with others in a classroom. In either case, being understood in the sense of having a conversation is not the poet's intent. Rather, it is as if the poet experiences a string of hallucinations or reveries and puts them into words. Whether anyone can make head or tail of them is of no concern to the poet. The "hallucinatory reverie" that is a poem functions just like the reversal in Machaut's composition. It is there for the artist—and as for the audience, if you find it, or something you can relate to yourself, why then, more power to you. The difference between Machaut and/or Chaucer's translation of Granson, on the

Downloaded from http://direct.mit.edu/books/book-pdf/2437419/book_9780262356947.pdf by guest on 21 November 2024

one hand, and Graham, on the other, is that in the former case you can eschew the Easter egg and still experience the art. In the latter case, the Easter egg is all.[3]

One can think of poetry as a balance between Poetry (P), its meaning for the poet, and poetry (p), the surface constraints into which Poetry is laced up. There seems to have been a symbiosis between P and p throughout the ages. A constrained surface through meter and rhyme meant accessibility to the Poetry behind the poem. But as constraints were abandoned, so too was accessibility.[4] Nothing illustrates this better than the Marvell and Graham poems just discussed.

In the Marvell poem, what you see is pretty much what you get. In the Graham poem, what you see is a syntactically well-formed string of words whose dictionary meanings are retrievable and can therefore be assigned a local meaning of some sort. We know what *a world of bone* means locally—something like "an imaginary world where bone is ubiquitous." But we don't know what *that* means. This is the stuff of Poetry with a capital P, and only the poet knows the answer. The reader is welcome to have a crack at it, of course.

For example, I once visited Dürnstein, a pretty little town on the Danube in Austria. It goes back at least to the twelfth century. Its only cemetery is surprisingly small, given the town's long history. Someone was tending the graves, which had been lovingly lined with bright plants and colorful flowers. It was a delightful garden spot. I asked the gardener about the disparity between the town's age and the size of the cemetery.

The gardener gestured toward a structure in the middle of the cemetery, a roof held up by walls made of iron bars. Steps led down to a locked door. Through the door I could see an enormous pile of skulls, femora, ulnae, and ilia. I couldn't tell how deep the pile was, but I guessed several centuries deep.

The gardener explained. The tradition was to bury a body and allow it to remain in its beautifully tended grave for 25 years. Then the bones were moved to the *Beinhaus*, the bone-house, in the middle of the cemetery. The grave was renovated like a rental apartment changing hands. So the grave was actually a halfway house rather than a final resting place. The open grave was left for the next occupant. Very efficient, I thought.

Downloaded from http://direct.mit.edu/books/book-pdf/2437419/book_9780262356947.pdf by guest on 21 November 2024

Now that is what the lines *world of bone/seen through to* meant to me: a bone pile caught sight of through iron bars. In other words, the phrase *world of bone* jostled my memory of that cemetery and I was able to elicit an interpretation. That was my P.[5] But to insert my meaning, "bone house," into Graham's poem makes no sense at all. I have no idea what Graham's meaning is. How could I? We've never even met.[6]

Downloaded from http://direct.mit.edu/books/book-pdf/2437419/book_9780262356947.pdf by guest on 21 November 2024

Downloaded from http://direct.mit.edu/books/book-pdf/2437419/book_9780262356947.pdf by guest on 21 November 2024

6

"Certain Conditions of Form and Organization": The Rules of Meter and Rhyme

The rule systems we are about to explore constitute the accessible part of poetry, Schlegel's "conditions of form and organization." They are accessible because they already exist in the minds of the poet and the listener/reader. They do not need to be discovered. This does not mean, of course, that children are born with these rules any more than children are born with the rules of English or whatever language is native to the child.

Rather, it means that metrical and rhyming phenomena are accounted for by rules that are natural to the brain. That is to say, the brain is hardwired to offer hypotheses about what the rules that account for metrical and rhyming behavior are, just as it is hardwired to formulate hypotheses about the rules that account for whatever language the child hears.

On the basis of preexisting hypotheses, then, the meter-and-rhyme learner formulates rules that account for metrical and rhyming behavior. Just as the rules of natural grammar enable a listener to determine whether or not a sentence is grammatical, these rules enable the listener to determine whether or not a given line is metrical and/or rhymes. Of course, the rules function differently for the poet and for the reader. For the poet, the rules are a filter that selects, from the infinite number of utterances of English, just those that qualify for some particular meter and rhyme scheme. For the reader, those same rules determine whether the lines in the poem indeed are metrical and rhyme.

This symbiosis between the poet and the listener is what I think of as producing a natural aesthetic. The reader finds a poem pleasing in part because the poet's verse has been the occasion for the reader to exercise those rules. In this sense, reading/listening to poetry is in the same neck of the woods as doing a crossword puzzle or listening to a quiz program. It is a kind of problem-solving wherein finding the solution is a source of

Downloaded from http://direct.mit.edu/books/book-pdf/2437419/book_9780262356947.pdf by guest on 21 November 2024

pleasure. That's not the whole story, by any means, but it's an important part of the story. (I'll have more to say about this later.)

To see how this works, consider this sonnet by John Keats, probably written in 1816.

How Many Bards Gild the Lapses of Time

How many bards gild the lapses of time!
A few of them have ever been the food
Of my delighted fancy,—I could brood
Over their beauties, earthly, or sublime:
And often, when I sit me down to rhyme,
These will in throngs before my mind intrude:
But no confusion, no disturbance rude
Do they occasion; 'tis a pleasing chime.
So the unnumber'd sounds that evening store:
The songs of birds—the whisp'ring of the leaves—
The voice of waters—the great bell that heaves
With solemn sound,—and thousand others more,
That distance of recognizance bereaves,
Make pleasing music, and not wild uproar.

The sonnet is about poetry done well and done badly. Line 1 condemns poets who wrap their poems in inept meter ("the lapses of time"). Line 5 talks of sitting down to "rhyme." Keats likens the sound of good poetry to the pleasing albeit unmetrical ("unnumbered") sounds of nature. He opposes both to the "wild uproar" of the poets who "gild the lapses of time." The first line ends with the phrase "the lapses of time" while the last line ends with the phrase "wild uproar" that describes those lapses. The symmetry is not accidental.

The reason why this sonnet is important for our purposes is the first line. Although the content of the poem is all about comparing good metrical practice with bad metrical practice, the first line is unmetrical.

Here is a simplified set of rules shareable by the poet and the listener:[1]

(1)

1. Definition of stress maximum:
A stressed syllable surrounded on both sides by a less-stressed syllable in the same syntactic constituent.

2. Metrical pattern for iambic pentameter:
W S W S W S W S W S

3. Constraint:
A stress maximum in the line must always correspond to an S position in the meter.

Downloaded from http://direct.mit.edu/books/book-pdf/2437419/book_9780262356947.pdf by guest on 21 November 2024

The notion of correspondence in (1.3) refers to mapping syllables onto metrical pattern positions. Each syllable must correspond to either a W or an S. Given that mapping, the initial (stressed) syllable of *lápses* in the phrase *the lapses of time* is problematic. It constitutes a stress maximum in accordance with (1.1). But it violates (1.3) because it corresponds to a forbidden metrical position for a stress maximum—namely, a W.

How many bards gild the lápses of time
| | | | | | | | |
W SW S W S ***W*** S W S

Did Keats make a mistake? Highly doubtful. Whenever a theorist and a great poet are in conflict, it is unlikely that the poet is the one at fault. Perhaps the theory is wrong. But there is another possibility: both are right.

Keats is writing a poem about writing a poem. In the very first line, the one we are considering, he decries poets who make metrical gaffes. Yet here he is doing precisely that. A moment's introspection shows that that is just the point. The opening line is a metrical joke. The line exemplifies what it is about. But most importantly for this discussion, Keats could not have made his metrical joke unless the relevant metrical rules, in this instance those in (1) (or their counterpart in some other theory) were in the heads of his readers.

The opening of Thomas Gray's "Elegy Written in a Country Churchyard" illustrates how the rules would scan the most regular form of an iambic pentameter line:

The **cúr**few **tólls** the **knéll** of **párt**ing dáy
| | | | | | | | | |
W S W S W S W S W S

According to definition (1.1) the line contains the maximum number of stress maxima, four. (The last stressed word is not a stress maximum because it is not surrounded on both sides by a less-stressed syllable.)[2] And each stress maximum corresponds to an S position.

We have seen an unmetrical line from the Keats sonnet. We have seen a perfectly regular line from Gray's "Elegy." Now consider this line from Shakespeare's *King Lear*. It is significant because, in one sense, it is the most important line in the play. It occurs at the very pinnacle of the drama, when Lear finally accepts the reality that the daughter he is

Downloaded from http://direct.mit.edu/books/book-pdf/2437419/book_9780262356947.pdf by guest on 21 November 2024

carrying in his arms is dead and that her death is his fault. Overwhelmed with that heartbreaking realization, he too dies. Here is the line:

```
Never, never, never, never, never.
 | |   | |   | |   | |   | |
 W S   W S   W S   W S   W S
```

It is a remarkable line because it is as un-iambic a line as one can imagine. On the surface, it consists of five trochees in a row. A trochaic sequence is the mirror image of an iambic one, consisting of a stressed syllable followed by an unstressed one (*fáncy*) as opposed to an iamb (*delíght*). And yet here we find it in a play written in iambic pentameter. How can we explain that? We could say that Shakespeare made a mistake. But, as with the line from Keats, that would be a dangerous move. If anyone were to have made a mistake, it would be the theorist, not one of the language's most brilliant versifiers. We could say that for the purposes of the play Shakespeare switched meters to trochaic pentameter. But that would be the only instance where he has done so. In any case, that would detract from Shakespeare's achievement.

Let's look at the rules again. The rules specify that if a line contains a stress maximum, then that stress maximum must correspond to an S position. The rules also define a stress maximum as a stressed syllable surrounded on both sides by less-stressed syllables in the same syntactic constituent. But there, as Shakespeare might have said, is the rub. Lear's dying line contains no stress maximum. It sounds like a trochaic line but it is iambic. Bringing the two meters into conflict matches the conflict the line represents. Every stressed syllable in the line is preceded either by silence (the first syllable) or by a syntactic break (indicated by a comma). It has five stresses well enough, but none of them qualify as a stress maximum. And the rules do not say that every line must contain a stress maximum—only that if there is one, it must correspond to an S position. Shakespeare's line is a brilliant bit of metrical maneuvering.[3]

The reason why I have presented this line here is that it shows how a master metricist can write lines that move to the very edge of acceptability but don't go beyond. Shakespeare's line is the very opposite of Gray's *The curfew tolls the knell of parting day*. Shakespeare has fit the meter to the occasion. We will see later on that in his Tenth Symphony, Gustav Mahler does exactly the same thing with the rules of tonal music.

Downloaded from http://direct.mit.edu/books/book-pdf/2437419/book_9780262356947.pdf by guest on 21 November 2024

Some version or other of the rules in (1) dominated English poetry from the time of Chaucer on. This is what H. T. Kirby-Smith (1998, 1) has to say about the verse tradition in English:

> Among many American poets and scholars, in particular, the assumption is that such visionary gleams of free verse as may be found in past centuries are mere prefigurations that were finally fulfilled after 1900, or at best made possible an increased receptivity to the experiments of the Imagists early in this century. This is, on the whole, a correct view; at no time before this century had anything identifiable as free verse been a dominant mode for poetry.

From the perspective of this discussion, what made free verse "a dominant mode for poetry" was the abandonment of a shared set of rules such as those in (1).

There is another important attribute of metrical verse that reflects shared rules that were abandoned. In both Oton de Granson's and Chaucer's poetry, the lines rhyme. In fact, by the fourteenth century rhyme was well-entrenched in Middle English.

The origin of rhyme is not at all clear. Some have argued that it began uniquely in China and made its way west.[4] Regarding the development of English rhyme, Michael McKie (1997, 821) points out:

> Hence any account of the origins of rhyme in English verse has to explain the sporadic but slowly increasing use of rhyme in Old English verse over three centuries, with a single poem, around the middle of that period, that used far more rhyme than any other English poem of that time; the period of about a hundred and fifty years, from about 1050–1200, in which verse had both alliteration and rhyme; the transition, completed by the early fourteenth century, to a Romance syllabic prosody, at first in the couplet and subsequently in stanzaic verse, in which end-rhyme was obligatory.

"The single poem" that McKie mentions is the anonymously authored "Rhyming Poem" dating anywhere from the eighth to the tenth century. It uses rhyme and alliteration simultaneously. This is a remarkable poem, one of a kind from a metrical point of view, at least within the English tradition.[5] Ruth Lehmann (1970, 437) begins her account of the poem as follows:

> The *Riming Poem* … of the *Exeter Book* is usually mentioned in treatments of Old English literature, but it is rarely given more than a page or two of discussion. In the first place, it stands alone in that it regularly rimes—abundantly rimes—and it also follows the regular alliterative pattern of other poems of the *Exeter Book*.

Downloaded from http://direct.mit.edu/books/book-pdf/2437419/book_9780262356947.pdf by guest on 21 November 2024

Because of the prominence of rhyme in English poetry and because it, like meter, depends on shared rules, it seems important to spend some time looking at it.

Let's begin with the rhyme scheme that a poem like *Beowulf* (circa eighth century) makes use of (as does the "Rhyming Poem"), namely, *alliteration*. Unlike the later "end rhyme" that dominated English verse from Chaucer on, this is a form of rhyme based on the identity of the initial segments of words. And, lest you feel a certain impatience with this excursus into Anglo-Saxon poetry, I assure you that what I am about to describe is, in fact, knowledge that you as an English speaker already have in your head and that I will force you to use before this excursus is over.

We start with the second line of *Beowulf:*

þeodcyninga,	þrym gefrunon,
Of those clan-kings	heard of their glory

The first sound of *þeodcyninga* (spelled here with the Anglo-Saxon character *þ*) is the same as the first sound of English *thin*. It is identical to the first sound of the first word of the second half line, *þrym*. It was via this kind of sound identity—this alliteration—that the vast majority of Anglo-Saxon poetry rhymed. This is the sort of thing that has led many critics to include the line

> and the silken sad uncertain rustling of each purple curtain

from Edgar Allan Poe's "The Raven" in their lists of the most memorable lines of English poetry.

Unfortunately, things are never as easy as they seem. Referring just to the "initial segment of a word" won't work in any definition of alliteration, as *uncertain* in "The Raven" and the following lines from *Beowulf* show:

24.

lēode gelǣsten	lofdǣdum sceal
liegemen loyal	with lauded deeds shall

47.

þā gȳt hīe him āsetton	segen gyldenne
then they set out for him	a golden standard

Downloaded from http://direct.mit.edu/books/book-pdf/2437419/book_9780262356947.pdf by guest on 21 November 2024

88.

þrāge geþolode,	sē þe in þȳstrum bād,
he suffered bitterly	he who in darkness dwelt

In the second word of line 24, *ge-* is a prefix followed by the primary stressed syllable *-læst-*.[6] But it is the /l/ of *-læst-* that alliterates, not the /g/ of *ge-*.[7] Similarly, in the fifth word of line 47, *a-* is a prefix followed by the primary stressed syllable *-sett-*. It is the /s/ that alliterates. The initial consonant cluster of the first word in line 88, *þrage*, is /þr/. It alliterates with the /þ/ of the second word, *geþolode*. It also alliterates with the /þ/ of the second word of the second half-line, *þe*, and of the fourth word of the second half-line, *þystrum*.

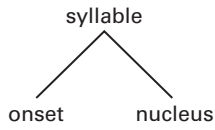
The pair *þrage and geþolode* show that the first consonant of a cluster preceding the primary stressed vowel is sufficient for purposes of alliteration. That is, remaining words that begin only with /þ/ and not /þr/ in the position before the primary stressed vowel will alliterate.

Now let's look at the "Rhyming Poem."[8] Here is the first line:

Mē līfes onlā́h	sē þis leoht onwrā́h.
He gave me life	who revealed the sun

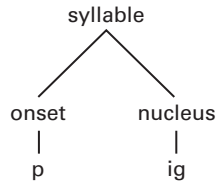
Alliteration and end rhyme are both at play in the single form *onlā́h* 'he gave'. The consonant preceding the primary stressed vowel establishes the alliterating segment. The primary stressed vowel and everything to its right constitutes the rhyme. In this sense, alliteration is the inverse (pun intended) of end rhyme. End rhyme requires the primary stressed vowel and everything to its right to be identical. Alliteration requires the initial segment of whatever cluster of segments precedes the primary stressed vowel to be identical. In other words, alliteration and rhyme require identity at opposite ends of the word.

To see more clearly what's going on, we need to understand something about syllable structure in English. The language game Pig Latin is helpful here. Let's start by assuming that English syllables are composed of two parts, an onset and a nucleus:



Downloaded from http://direct.mit.edu/books/book-pdf/2437419/book_9780262356947.pdf by guest on 21 November 2024

The word *pig* then has a structure like this:



That is, within a syllable the nucleus begins with the stressed vowel. The segments that precede the stressed vowel are the onset. Using this structure, we can state the rules of Pig Latin like this:

To change any word into its Pig Latin form

1. Add a new syllable to the end of the word.
2. Move the contents of the original onset into the new onset.
3. Put the sequence /ay/ in the new nucleus.

These rules change the syllable structure of the word *strode* to its Pig Latin form *odestray*, as shown in figure 6.1. Referring to the onset allows us to explain why the whole cluster /str/ moves and not just a part of it, like /s/, /t/, or /tr/.[9]

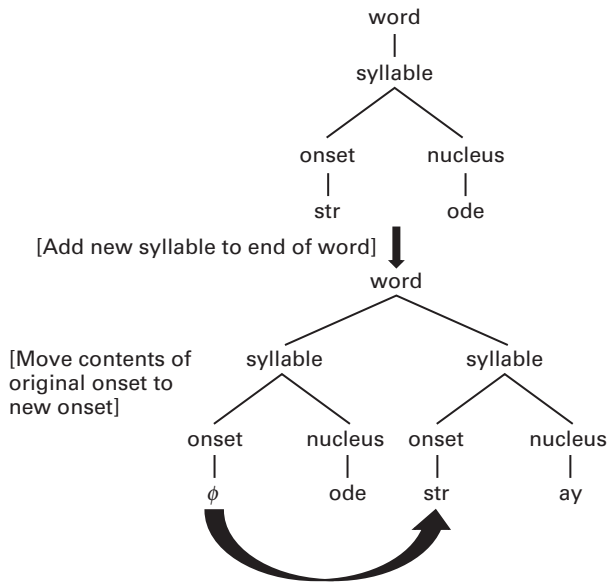


Figure 6.1

Downloaded from http://direct.mit.edu/books/book-pdf/2437419/book_9780262356947.pdf by guest on 21 November 2024

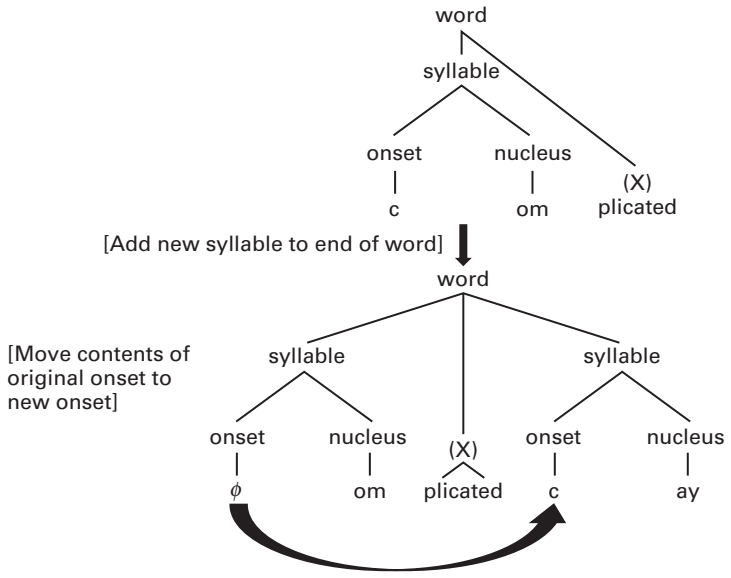


Figure 6.2

The rule is a bit more complicated since it has to work for longer words like *complicated* ➛ *omplicated* + *cay*. To take such words into account, we need to insert a variable X after the first syllable in the syllable tree, where X stands for any number of segments including none. X does the trick since no matter how long a word might be, for Pig Latin it is only the first syllable that matters.[10] The modified tree is shown in figure 6.2.

Armed with this conception of syllable structure, we can now state the rule of alliteration quite simply:

Alliteration: Two words alliterate when the initial element of the onset adjacent to the primary stressed vowel of one is identical to the initial element of the onset adjacent to the primary stressed vowel of the other.[11]

Now let's look at end rhyme.[12] To begin with, every rhyming poem has a rhyme scheme that tells the reader which words must rhyme. Take Keats's sonnet, repeated here:

How Many Bards Gild the Lapses of Time

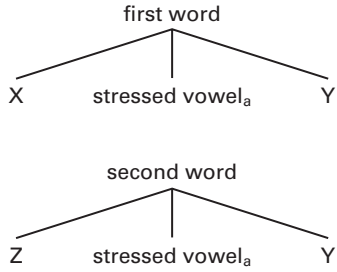
How many bards gild the lapses of time!	a
A few of them have ever been the food	b
Of my delighted fancy,—I could brood	b

Downloaded from http://direct.mit.edu/books/book-pdf/2437419/book_9780262356947.pdf by guest on 21 November 2024

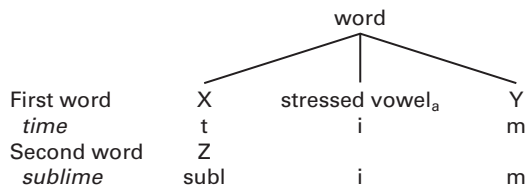
Over their beauties, earthly, or sublime:	a
And often, when I sit me down to rhyme,	a
These will in throngs before my mind intrude:	b
But no confusion, no disturbance rude	b
Do they occasion; 'tis a pleasing chime.	a
So the unnumber'd sounds that evening store:	c
The songs of birds—the whisp'ring of the leaves	d
The voice of waters—the great bell that heaves	d
With solemn sound,—and thousand others more,	c
That distance of recognizance bereaves,	d
Make pleasing music, and not wild uproar.	c

The rhyme scheme in this poem is that of a typical Italian sonnet. The letters to the right specify the lines that must rhyme. That is to say, the word or syllable in the last S metrical position of a line must rhyme with its partner word or syllable in a like-lettered line. But what does it mean for two words to rhyme—say, *time* and *sublime* as in lines 1 and 4?

As it turns out, end rhyme is much easier to define than alliteration. We can say that two words rhyme if their stressed vowels and everything to the right of their stressed vowels are identical while everything else in the word is not. We can represent this relationship like this:



We can think of these as templates that you fit over the word. Let's return to *time* and *sublime*. In the "first word" template, X = /t/, stressed vowel = /i/, and Y = /m/. In the "second word" template, Z = /subl/, stressed vowel = /i/, and Y = /m/.[13] The conditions are met: namely, the stressed vowel and everything to its right is identical in the two templates. Everything else (Z and X) is not—like so:



Downloaded from http://direct.mit.edu/books/book-pdf/2437419/book_9780262356947.pdf by guest on 21 November 2024

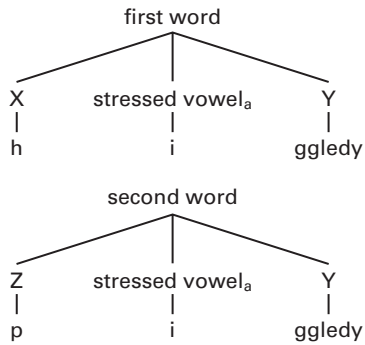
It is illustrative of Keats's metrical agility, I think, that the first line of the poem ends with the unmetrical sequence *the lapses of time* while the last line ends with the metrical sequence *wild uproar*, a metrically legitimate albeit complex commentary on its illegitimate partner.[14]

Up to now the identical part of the rhyming sequence—the stressed vowel and everything that follows it—has constituted a single syllable. That has been a consequence of the meter we have been focusing on. Choose another meter, and the stressed vowel can recede from the end of the line.

How far away from the end of a line can the stressed vowel be? It can be farther than a single syllable, as in this dactylic (SWW) dimeter couplet rhyming *higgledy* with *piggledy*:[15]

Here they come higgledy,
S W W S WW
There they go piggledy.
S W W S WW

The templates for the pair *higgledy-piggledy* are these:



This rhyme shows that the sequence to the right of the stressed vowel can extend over several metrical positions, the only limitation being that in English, stressed vowels are generally no more than three syllables away from the end of the word. This isn't always true, however. For example, here is a well-formed trochaic couplet where the stressed vowel is four syllables away:

Those who seek the presidency
S W S W SWS W
Must have U.S. residency
S W S W SWS W

Downloaded from http://direct.mit.edu/books/book-pdf/2437419/book_9780262356947.pdf by guest on 21 November 2024

What about in the other direction—that is, from the beginning of the word? English is much freer in that direction. Consider this familiar example:

supercalifragilisticexpialidocious!
S W SW S WS WS WSWS W

Even though the sound of it is something quite atrocious
S W S W S W S W S W S W S W

If you say it loud enough you'll always sound precocious
S W S W S W S W S W S W S W

Supercalifragilisticexpialidocious!
S W SW S WS WS WSWS W

The meter here is known as a fourteener (seven repetitions of the unit S W).[16] The rhyme scheme is a a a a, and the rhyming templates are shown in figure 6.3.

The nonrhyming portion of the word goes all the way back to the beginning of the line, extending over twelve metrical positions.[17]

We can now see an important difference between end rhyme and alliteration: the latter requires reference to syllable structure. End rhyme only needs to know where the stressed vowel is. Then it divides the word into everything that precedes the stressed vowel and everything that follows it within the word, without reference to syllable structure.

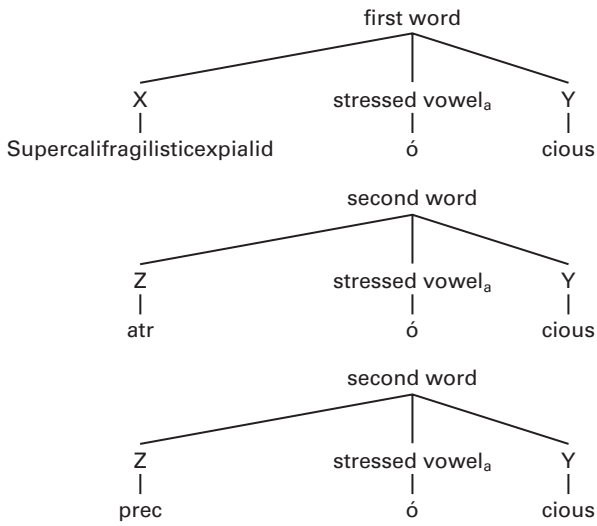


Figure 6.3

Downloaded from http://direct.mit.edu/books/book-pdf/2437419/book_9780262356947.pdf by guest on 21 November 2024

That onsets are not relevant to end rhyme is illustrated by the rhyming pair *collusion/illusion*. In this pair, the stressed vowels are identical and so are the following segment strings. However, the onset immediately preceding the stressed vowel in the two cases is also identical—that is, /l/. What triggers rhyme in this pair is the nonidentity of the string to the left of the stressed vowel. Any theory of rhyme based on the content of the onset to the left of the primary stressed vowel would run up against this problem of identity of the onsets.[18]

A major thesis of this book has been that the rules of the sister art forms are shared by artist and audience in just the same way that the rules of a natural language are shared between speaker and hearer. So far, we have looked at two processes relating to poetic rhyme, alliteration and end rhyme. Now consider an example that has nothing to do with poetry, namely, the following headline from *Slate* magazine (January 8, 2019, 5:07 p.m.):

> Manafort Filing Suggests Mueller Has Evidence of Something That Starts With *C* and Rhymes With *Schmollusion*

The headline writer must have assumed that *Slate* readers know the English construction that gives rise to the rhyming puzzle, because the answer to the puzzle is the point of the headline.

So what is going on here? English has a rule that creates rhymes with a special semantic import. The rule takes a word and duplicates it. Then it changes the phonological content of the duplicate. As a result, the two words now rhyme. This convoluted process is intended to convey denigration, most likely because the duplicate comes out sounding like a comical Yiddish mispronunciation of the offending word. Here is the process at work in an imaginary conversation:

First speaker: What's wrong with you?

Second speaker: Why?

First speaker: You don't look happy.

Second speaker: Happy. Schmappy. Who needs happy?

Using the tools we have already developed, we can describe what has happened in two easy steps:

1. Duplicate the offending word.
2. Replace the duplicate's initial onset with /shm/.[19]

Downloaded from http://direct.mit.edu/books/book-pdf/2437419/book_9780262356947.pdf by guest on 21 November 2024

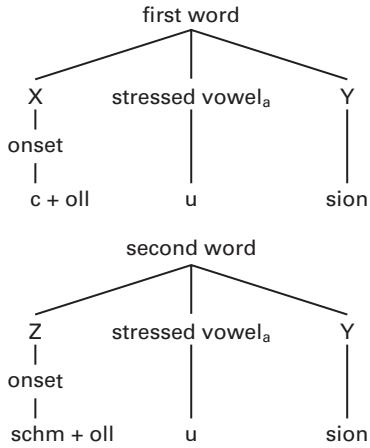


Figure 6.4

Let's run the headline through this grinder, only backward. We start with *Schmollusion*. We know the rule. So we remove the sequence /shm/ from the initial onset, leaving the incomplete word [onset] + *ollusion*. The headline writer has given us clues: the mystery word rhymes with *Schmollusion* and starts with the sound /k/ (spelled *c*). We place *c* in the now empty onset. Lo and behold: *collusion*:*Schmollusion*. Does it rhyme? We apply the two-word template (see figure 6.4). The template fits. The words rhyme. The headline suggests that Mueller has evidence of collusion.

The construction may have an Eastern European origin and it may be over 400 years old. The account given here is a pale shadow of the phenomenon in all of its creative linguistic complexity. For that, you should consult Nevins and Vaux 2003. The account will suffice, however, since the main point is to demonstrate the essence of the phenomenon and to establish that it is part of our knowledge of English and not some kind of special add-on. This is certainly Nevins and Vaux's view, as they note in their conclusion (p. 721):

> We have shown, through our survey, that speakers have clear and consistent linguistic intuitions, suggesting that shm-reduplication is computed in the grammar, and that the systematic responses of speakers to these forms show that this is not a metalinguistic phenomenon to be dismissed, and that the notion of metalinguistic is vacuous here, as speakers' strategies still manipulate phonological objects.

Downloaded from http://direct.mit.edu/books/book-pdf/2437419/book_9780262356947.pdf by guest on 21 November 2024

Understanding the headline means, therefore, that our internalized knowledge of English includes the same processes that give rise to rhyme and alliteration in poetry. In other words, this example is precisely like the *lapses of time* example from Keats. We couldn't possibly get it if we didn't share the same rules as the headline writer. Furthermore, the /shm/ rule shows the symbiotic nature of rules of verse formation and rules of natural language.[20] Indeed, this rule is an incorporation into natural language of a verse-based rule—it creates a rhyme—just as the metrical grid appears to be a shared function between stress placement in English and beat construction in music (see chapter 7).

In the poetic processes we have examined—rhyme, alliteration, and meter—stressed vowels and onsets have been critical. Alliteration makes use of both. Rhyme and meter make use of stress.[21] It is striking how often stress plays a role. It is critical for alliteration. It is critical for rhyme. It is critical for meter, and, of course, it is an intrinsic part of every word in the English dictionary. Indeed, stress also seems to be tied into our motor system. Try pounding your fist into the palm of your hand to emphasize the word *fantastic*. Your fist will strike your palm just as you pronounce the primary stressed syllable. Now try to say *fantastic* while timing your fist to strike your palm as you pronounce any other syllable. That is hard to do and when you do it, it feels unnatural. And, of course, there is metrical verse itself, which, as we have seen, depends crucially on the strong stresses in a word or syllable. It is not surprising that poets make use of this prominent property in constructing a metrical poem. Its prominence carries with it the expectation that the listener will be able to access it to determine the metricality of a given line.

McKie (1997, 821) notes that by the early fourteenth century, "a Romance syllabic prosody, at first in the couplet and subsequently in stanzaic verse, in which end-rhyme was obligatory" had taken firm root. From then on and for the next 800 years, end-rhyming metrical verse reigned supreme in English verse, but not exclusively. When he wrote *Paradise Lost*, John Milton dropped the obligatory requirement for end rhyme. But he also felt that he had to justify doing so. This is what he wrote in the introduction to his first edition:

> The Measure is *English* Heroic Verse without Rime, as that of *Homer* in Greek, and *Virgil* in Latin; Rhime being no necessary Adjunct or true Ornament of Poem or good Verse, in longer Works especially, but the Invention of

Downloaded from http://direct.mit.edu/books/book-pdf/2437419/book_9780262356947.pdf by guest on 21 November 2024

> a barbarous Age, to set off wretched matter and lame Meeter; grac't indeed since by the use of some famous modern Poets, carried away by Custom, but much to thir own vexation, hindrance, and constraint to express many things otherwise, and for the most part worse then else they would have exprest them. Not without cause therefore some both *Italian*, and *Spanish* Poets of prime note have rejected Rhime both in longer and shorter Works, as have also long since our best *English* Tragedies, as a thing of itself, to all judicious ears, triveal, and of no true musical delight; which consists onely in apt Numbers, fit quantity of Syllables, and the sense variously drawn out from one Verse into another, not in the jingling sound of like endings, a fault avoyded by the learned Ancients both in Poetry and all good Oratory. This neglect then of Rhime so little is to be taken for a defect, though it may seem so perhaps to vulgar Readers, that it rather is to be esteem'd an example set, the first in *English*, of ancient liberty recover'd to heroic Poem from the troublesom and modern bondage of Rimeing.

Milton's apologia underscores an important asymmetry. You can have a metrical line without rhyme. You can even have rhyme without meter.[22] But a rigid rhyme scheme requires metrical lines. This suggests a certain topography of verse.[23]

Suppose we say that the basic unit of any meter is the line. Then we can think of meter as a way of defining the length of a line by organizing it into smaller repeating units. We can think of rhyme as a way of enhancing the line end. That would give us a three-layered structure of sorts:

(2)

1. The line: The basic unit of poetry
2. Meter: Division of the line into metrical units
3. Rhyme: An enhancing constraint on metrical units, the so-called rhyme scheme (pace Milton)

There is a subtlety in (2) that needs some attention. (2.3) says that scannable lines can be enhanced by rhyme schemes. This does not mean that unscannable lines cannot rhyme. William Butler Yeats's "Broken Dreams" is a case in point.[24]

While "Broken Dreams" is not metrical, it does rhyme. The first 13 lines show a rhyming pattern of sorts:

There is grey in your hair.	a
Young men no longer suddenly catch their breath	b
When you are passing;	c
But maybe some old gaffer mutters a blessing	c[25]
Because it was your prayer	a

Downloaded from http://direct.mit.edu/books/book-pdf/2437419/book_9780262356947.pdf by guest on 21 November 2024

Recovered him upon the bed of death.	b
For your sole sake—that all heart's ache have known,	d
And given to others all heart's ache	e
From meagre girlhood's putting on	d
Burdensome beauty—for your sole sake	e
Heaven has put away the stroke of her doom	f
So great her portion in that peace you make	e
By merely walking in a room.	f

Up to this point, every line-final word has a rhyme somewhere else within the first 13 lines, although the pattern hardly qualifies as a rhyme scheme like that of Keats's Italian (Petrarchan) sonnet "How Many Bards Gild the Lapses of Time." As the poem continues, the pattern disintegrates:

Your beauty can but leave among us	g
Vague memories, nothing but memories.	h
A young man when the old men are done talking	i
Will say to an old man, "Tell me of that lady	j
The poet stubborn with his passion sang us	g
When age might well have chilled his blood."	k

At this point, *us:us* hardly deserves to be called a rhyme, even an identical one. The disintegration of the earlier ragged rhyme scheme is explained in the final three lines:

> From dream to dream and rhyme to rhyme I have ranged
> In rambling talk with an image of air:
> Vague memories, nothing but memories.

Yeats says explicitly that the rhyme scheme is rambling. In fact, the imposition of a precise rhyme scheme would undercut the poem's atmospheric, vague memories imprecisely recalled.

That is what (2.3) is meant to capture. Rhyme schemes are properties of metrical verse. To put it differently, there is a difference between rhyming and rhyme schemes. Only the latter appear in metrical verse.

The levels of (2) can be used to characterize English verse practice from the early fourteenth century up to the twentieth century. For example, (2) in its entirety characterizes the poetry exemplified by Keats's sonnet. The vast majority of English verse is of this sort. However, if you eliminate (2.3), you have blank verse as in Milton's *Paradise Lost*:

Downloaded from http://direct.mit.edu/books/book-pdf/2437419/book_9780262356947.pdf by guest on 21 November 2024

Of Mans First Disobedience, and the Fruit
Of that Forbidden tree whose mortal taste
Brought Death into the World, and all our woe,
With loss of *Eden*, till one greater Man
Restore us, and regain the blissful Seat,
Sing Heav'nly Muse, that on the secret top
Of *Oreb*, or of *Sinai*, didst inspire
That Shepherd, who first taught the chosen Seed,
In the Beginning how the Heav'ns and Earth
Rose out of *Chaos*: or if *Sion* Hill
Delight thee more, and *Siloa*'s brook that flow'd
Fast by the Oracle of God; I thence
Invoke thy aid to my adventrous Song,
That with no middle flight intends to soar
Above th' *Aonian* Mount, while it pursues
Things unattempted yet in Prose or Rhime.

Each line is in iambic pentameter, but none of the lines rhyme, the final line of the above passage notwithstanding. Unlike Chaucer, Milton clearly saw rhyme as a bothersome constraint in a poem as long as *Paradise Lost*. So, he treated it much the way he treated divorce. When he wanted a divorce, at a time when divorce was beyond the pale, he wrote a treatise justifying it.[26] Then he got one. By the same token, when he wanted to write a long poem in blank verse, he wrote *Paradise Lost*. Then he wrote an introduction trashing rhyme.

Had he gone one step further and eliminated (2.2), he would have anticipated Walt Whitman and Ezra Pound by several centuries.

In 1915 Pound began—but never finished—one of the major poems of the new versification, his *Cantos*. His only metrical unit was the line itself. He had succeeded in eliminating metricality and, a fortiori, systematic rhyme schemes. These are lines 48–58 at the beginning of his Canto 81 in which he declares pentameter verse bankrupt:

"You will find" said old André Spire,
that every man on that board (Crédit Agricole)
has a brother-in-law
"You the one, I the few"
said John Adams
speaking of fears in the abstract
to his volatile friend Mr. Jefferson.
(To break the pentameter, that was the first heave)
or as Jo Bard says: they never speak to each other,
if it is baker and concierge visibly
it is La Rouchefoucauld and de Maintenon audibly.

Downloaded from http://direct.mit.edu/books/book-pdf/2437419/book_9780262356947.pdf by guest on 21 November 2024

The eighth line notwithstanding, toward the end of the canto there is a chant section skillfully written in perfect iambic pentameter, something that Pound wanted to break a hundred lines or so earlier. He is like Baudelaire, who argued in 1859 for the necessity of rules and three years later longed for their destruction, although Pound went back on himself in the space of just seventy lines. The usual interpretation of Pound's switch into meter is that it signals a switch in tone. Anthony Woodward (1980, 91) puts it this way:

> The artful rhetoric, and then the sudden change of tone, have the effect of establishing a remoteness from the religious wholeness craved. So too a hint of distance and loss is the silent companion of the exquisitely moulded cadences of this slightly later section of Canto 81.

The switch from what Woodward (p. 89) calls "so fluid a poetic medium" is, of course, noticeable. It is like walking from cobblestones onto a putting green. But suppose the section before the "moulded cadences" were written like this:

> "You will find" said old André Spire, that every man on that board (Crédit Agricole) has a brother-in-law. "You the one, I the few" said John Adams speaking of fears in the abstract to his volatile friend Mr. Jefferson. (To break the pentameter, that was the first heave) or as Jo Bard says: they never speak to each other, if it is baker and concierge visibly it is La Rouchefoucauld and de Maintenon audibly.

This version of the canto drops (2.1), the last vestige of a verse form. Had Pound, having already abandoned (2.2) and (2.3), jettisoned (2.1) as well, he would have left poetry behind and entered the realm of prose. As Jeremy Bentham put it, "Prose is when all the lines except the last go on to the end. Poetry is when some of them fall short of it." Would it make any difference to the listener if the earlier portion of the canto were laid out as prose and the later (iambic pentameter) portion as verse? I think the answer has to be no. It is only in the reading on the page itself that the difference is perceived.

Listening to metrical verse, one can tell when a line ends because of the shared rules. Rhyme is an important signal as well. But even in unrhymed metrical verse, one can tell where the line ends if one has internalized the metrical rules. That is not the case with free verse. There are no rules that govern line length. The line ends where the poet chooses to insert a line break; there is no generalized set of rules comparable to those for metrical verse that can account for where the line breaks fall. Consequently,

Downloaded from http://direct.mit.edu/books/book-pdf/2437419/book_9780262356947.pdf by guest on 21 November 2024

when one listens to free verse, there is no way to tell that one line has ended and another has begun. Think of Jorie Graham's "San Sepolcro" once again. Laid out as prose, the first sentence looks like this:

> In this blue light I can take you there, snow having made me a world of bone seen through to.

Reading the poem read aloud from the page as Graham laid it out and reading it aloud from a text laid out according to Bentham's dictum would be indistinguishable. If a performer were to introduce some sort of pause or prosodic marker to indicate where the lines end on the printed page, the poem would surely sound stilted and artificial.

This is also true of metrical verse where line lengths vary. An example is the opening seven lines of T. S. Eliot's "The Waste Land":

April is the cruellest month, breeding	9
Lilacs out of the dead land, mixing	9
Memory and desire, stirring	8
Dull roots with spring rain.	5
Winter kept us warm, covering	8
Earth in forgetful snow, feeding	8
A little life with dried tubers.	8

Nigel Fabb and Morris Halle (2008, 90–91) scan these lines as loose iambic pentameter, a term used by Robert Frost, who held that in English there are really only two kinds of meter, strict and loose iambic. The point is that in "The Waste Land," line lengths vary from dimeter to pentameter. Consequently, with eyes closed the listener cannot tell where one poetic line ends and the next begins; the repetition of line-ending participles in the first six lines is a crutch that quickly disappears. Eliot's metrical practice constitutes a halfway house on the journey from Chaucer to poets like William Carlos Williams and Jorie Graham.

The history of English verse from Chaucer through Milton's *Paradise Lost* to Ezra Pound's *The Pisan Cantos*, then, is basically a history of shedding shared constraints that end with free verse, essentially a visual meter as opposed to a metrical one.

This has not gone unnoticed. H. T. Kirby-Smith (1998, 211) writes:

> As we approach the end of the twentieth century, the truth is that for much published poetry its appearance on the page does matter—that in fact visual arrangement may be more important than any recurrent patterns that appeal to the ear.[27]

Downloaded from http://direct.mit.edu/books/book-pdf/2437419/book_9780262356947.pdf by guest on 21 November 2024

The centuries-long process of shedding aural constraints ended when modernism consigned much of poetry to how it looked on the page. There is a parallel between this and painting's shift of attention away from mimesis toward how its materials—brushstroke, pigment, canvas—appear on a flat surface. In both instances, the look of the medium became an important if not dominating factor.

The shift of poetry away from rhyme and meter raises a question about the location of these two rule systems in the brain. One might think—given our present knowledge of neural circuitry and the abstract representation of rule systems—that very little light could be shed on this question. As it happens, that is not so, thanks to research with a woman known as Chelsea undertaken by Susan Curtiss and her colleagues (2013).

Chelsea was born profoundly hearing-impaired. Her inability to hear was not appreciated until she reached the age of 32. Curtiss's primary interest was to determine Chelsea's grammatical capability and compare it with other cognitive functions, such as her ability to count. Chelsea turned out to have no grammatical functioning at all. Although she could remember words—she had a 50-word lexicon when Curtiss encountered her and that number increased over time—grammatical constructions eluded her completely.

On the other hand, as it turned out, Chelsea's arithmetic functioning was quite serviceable (Curtiss 2013, 77). She could add, subtract, multiply, and divide. She could balance a checkbook, make change in a store or restaurant, and tell time. She did all of this without the aid of grammar. This points strongly to a dissociation between the grammatical and arithmetic functions in the brain. That is to say, they are separate and distinct cognitive functions. Other work by Curtiss and her colleagues supports this conclusion (see Grinstead et al. 1998; Curtiss 2014).

Now comes, from the point of view of this book, an unexpected implication of Curtiss and her colleagues' work. Recall our templates and conditions that determine whether two words rhyme. Together these represent a cognitive function of the brain, a small one of course, but a real one nonetheless. Somewhere in that mental wetware is the instantiation of the rhyming templates.

And indeed, in the course of her work, Curtiss found that Chelsea also had the ability to tell when two monosyllabic words rhyme.[28] This is a remarkable discovery because, by parity of reasoning, it suggests that the

Downloaded from http://direct.mit.edu/books/book-pdf/2437419/book_9780262356947.pdf by guest on 21 November 2024

phonological component of our ability to speak is, like arithmetic, dissociated from the grammatical function. In other words, the phonological component of the grammatical function of the brain must be an add-on, something that was added on to the grammar, most probably as a way of enabling *Homo sapiens* to externalize the products of the grammatical function by linearizing it.

One might even think of phonology as akin to numerical synesthesia, the sensation of experiencing an association between a given number shape and color—for example, perceiving 1 as red, 2 as yellow, and so forth. V. S. Ramachandran (2004) suggests that numerical synesthesia, a phenomenon that occurs in one out of every 200 people, is the result of the physical proximity in the brain of the areas dedicated to recognizing number shapes and color. Because of this neural proximity, dendritic leakage between the two primary function areas might be expected to take place, producing an emergent property: numerical synesthesia.

One can imagine that phonology followed the same route. It arose as a separate function in the brain for whatever reason, but its proximity to the grammatical function gave rise to the emergent property of being able to linearize the productions of the grammatical function by means of the vocal tract. From the point of view of natural selection, the benefit is obvious. Without phonology, the only way to communicate meaning would be by signing. In other words, the first language was probably some sort of sign language. Once the possibility of vocalization emerged, it would have a definite selectional advantage. One could now communicate in the dark.

I have suggested that rhyme exploited the phonological function to adorn metrical verse, very likely as a way of enhancing the end of a metrical line. But what about meter? The stress maximum defined in (1) makes use of syntactic constituent structure. It does so because of lines like Shakespeare's *Never, never, never, never, never*. The reference to syntax in that definition entails that meter, unlike rhyme, is not dissociated from the grammatical function.

This might not be the case, however. To begin with, *Never, never, never, never, never* contains no syntactic structure. Rather, it consists of items in a series, like a telephone number or the alphabet.[29] If there were some way to eliminate reference to syntactic structure in the metrical assignment rule, then it might be possible to relegate both rhyme and meter to

Downloaded from http://direct.mit.edu/books/book-pdf/2437419/book_9780262356947.pdf by guest on 21 November 2024

the phonological component alone. In fact, Hayes (1989, 224) makes precisely this startling and attractive claim:

> I would like to suggest that metrical rules NEVER refer to syntactic bracketing, only to prosodic bracketing. In other words, syntax has effects in metrics only insofar as it determines the phrasings of the Prosodic Hierarchy. This claim is the metrical counterpart of Selkirk's (1981) contention that syntactic effects in phonology are limited to the determination of phrasing. Intuitively, the hypothesis states that meter is essentially a phonological phenomenon; thus we might call it the Hypothesis of Phonological Metrics.

Given Chelsea's ability to discern whether two words rhyme, Hayes's theoretical insight allows us to draw a tight connection between meter and rhyme by locating both processes in the phonological component. It also allows us to put in a grammatical light the difference between traditional English verse and free verse.

When free verse abandoned the phonological component as a source of poetic constraint, it abandoned poetry as an aural art form. But so as not to throw out the baby with the bath water, a substitute for rhyme and meter had to be found in order to preserve the notion of a poetic form. Without a constraint of some sort, there would be no genre, just straight prose. The simplest property that the grammatical component had to offer was the line break.

In a sense, this was the weakest possible constraint. The poet could end a line almost anywhere. For example, on two occasions in "San Sepolcro," Jorie Graham inserts the break in the middle of a compound noun; between *assembly* and *line* in the compound [assémbly lìne] (lines 29–30) and between *air* and *market* in the compound [ópen-air màrket] (lines 31–32). She shows a propensity to otherwise end lines with prepositional phrases, roughly 30% of the time in "San Sepolcro."

In practice, however, poets have placed line breaks virtually anywhere, as e. e. cummings's poem "Old Age Sticks" illustrates:

> old age sticks
> up Keep
> Off
> signs)&
>
> youth yanks them
> down(old
> age
> cries No

Downloaded from http://direct.mit.edu/books/book-pdf/2437419/book_9780262356947.pdf by guest on 21 November 2024

Tres)&(pas)
youth laughs
(sing
old age

scolds Forbid
den Stop
Must
n't Don't

&)youth goes
right on
gr
owing old

Notice that this poem demands that it be read on the page rather than be recited. The effect of the ampersands would be completely lost if the poem were read aloud. Would you read the line "old age sticks/up Keep/ Off signs) *ampersand* /youth yanks them/down"? Furthermore, the line break after the onset of *growing*—namely, /gr-/—is nonexistent in recitation. Its effect would be totally lost.

Although the poem employs a variety of line breaks in unexpected places, there are limits, however weak. The break after *Forbid* is both morphemic and syllabic: *forbid* + *en*. The same is true of *must* + *n't*. These examples drive home the point that free verse is essentially visual verse. There is no way one could sensibly put a pause inside *forbidden*, *mustn't*, or *growing*.

That said, one would never expect to find a line break after the *g* in *age*, where there is no constituent boundary at all, phonemic or morphemic, the letter *e* being a spelling convention. But who knows? The constraint is, as Frost said, like playing tennis without a net. Actually, it is even stranger.

What kind of art form "Old Age Sticks" is depends on how you come upon it. If you read it on the printed page, it is a poem. All those line breaks are laid out clearly, for you to see. (Remember *gr/owing*.) If you listen to it, it is prose. (Now it is *growing*.) I can't think of another art form that changes genre depending upon which sense perceives it.

At this point, it might be useful to suggest why poetry existed for such a long time before jettisoning the phonological component as a source of poetic form. A reasonable place to start is the pleasure that derives from an aesthetic experience. What does that mean? Thomas Bever (1986,

Downloaded from http://direct.mit.edu/books/book-pdf/2437419/book_9780262356947.pdf by guest on 21 November 2024

325) describes the aesthetic experience in a way reminiscent of a drug experience, only without the drug:

> The emotional force of problem solving is interesting in its own right. This discussion so far has presupposed that it is a basic property of human cognition to get a thrill from solving a problem. … From that standpoint, what is important is that the first intuition that a problem is solved evokes a burst of pleasurable energy. Whatever its source, we know this to be true.

If art is as an activity that engages the natural aesthetic, then reading, looking at, or listening to a work of art might well be akin to problem-solving.[30] For example, V. S. Ramachandran (2004, 51) writes:

> [T]he wiring of your visual centers to your emotional centers ensures that the very act of searching for the solution [to what it is you are looking at] is pleasing, just as struggling with a jigsaw puzzle is pleasing long before the final "a-ha." Once again it is about generating as many "a-has" in your brain as possible. Art may be thought of as a form of visual foreplay before the climax.

This is a widely shared view among neuroaestheticians. Anjan Chatterjee (2014, 106) puts it this way:

> We experience pleasure when we figure things out, an effect that the developmental psychologist Allison Gopnick fancifully called "explanation as orgasm" (cf. Gopnick 1998). Babies purse their lips and wrinkle their brows when presented with problems that are confusing. When they figure out the answer, they smile and look radiant. … So we have this reverberating cycle of pleasure helping us learn and what we have learned giving us pleasure. These cognitive pleasures may be the reason we experience pleasure with some conceptual art. Figuring out what they mean tickles our reward systems.

Eric Kandel (2012, 393) puts it this way:

> Art is an inherently pleasurable and instructive attempt by the artist and the beholder to communicate and share with each other the creative process that characterizes the human brain—a process that leads to an Aha! moment, the sudden recognition that we have seen into another person's mind, and that allows us to see the truth underlying both the beauty and the ugliness depicted by the artist.

I hope you will indulge me if I describe a personal experience that perfectly captures what Kandel writes about. During the years 2013–14, up until a spinal cord injury made it impossible, my morning exercise consisted of a walk from my home to Harvard University, roughly a mile away. I listened to audiobooks on these walks. I would sit at a small outdoor table just behind the new law school, sipping coffee and enjoying whatever book was on my mobile phone. On one such outing, I was

Downloaded from http://direct.mit.edu/books/book-pdf/2437419/book_9780262356947.pdf by guest on 21 November 2024

Figure 6.5

listening to Marcel Proust's *Remembrance of Things Past* while I gazed idly at a nearby sculpture by the renowned American sculptor John Safer (see figure 6.5).

Although I had sat next to this sculpture day after day for several months, I never saw it as anything other than three abstract shapes—blobs, if you will. This particular morning, out of the blue, I realized that the upward-arcing forward edge of the blob on the right resembled a medieval executioner's ax. Suddenly, the entire sculpture snapped into focus. The middle shape was an executioner's block; the shape to the left, an executioner's masking headgear. That was an *aha* moment if ever there was one. The sculpture had been a problem and I had solved it to my immense pleasure. My excitement was palpable. Only then did I think to see if the sculpture was titled. Indeed, it was. On one corner of the platform, a plaque bore the word *Judgment*.

For a time I was like the Ancient Mariner, "who stoppeth one of three." I would ask passersby if they had ever lingered long enough to actually look at that sculpture. One woman, who worked in a nearby building, told me she had passed it for 11 years. She had no idea what it was. She

Downloaded from http://direct.mit.edu/books/book-pdf/2437419/book_9780262356947.pdf by guest on 21 November 2024

was delighted to know. I did that on several occasions until I realized that maybe I was becoming a nuisance. That was the measure of my joy at having solved the problem of *Judgment*.[31]

This way of putting things of course raises a question: What is the mental representation of the problem that is being solved? My claim is that, for mimetic art, it is the mental representation assembled from the outputs of various areas of the brain—specifically, the fusiform gyrus and the parahippocampal and extrastriate body areas (among others, of course)—upon exposure to a painting. Assembling an appropriate mental representation constitutes solving a problem, rather like building a car out of Lego pieces. This act of construction is what Bever, Chatterjee, and Ramachandran think of as pleasing. Ramachandran (2004, 59) puts it this way:

> The solution to the problem of aesthetics, I believe, lies in a more thorough understanding of the connections between the thirty visual centers in the brain and the emotional limbic structures (and of the internal logic and evolutionary rationale that drives them). Once we have achieved a clear understanding of these connections, we will be closer to bridging the huge gulf that separates C. P. Snow's two cultures—science on the one hand and arts, philosophy and humanities on the other.

To take another example, the pleasure one derives from listening to or reading metrical verse in part involves the inherent challenge for the listener/reader to determine whether the poet has obeyed the rules in constructing the lines. The challenge for the poet is to obey the rules in composing the lines. In each case, a problem is posed and aesthetic pleasure comes from its solution.

I have suggested that rhyme within a rhyme scheme is a property of metrical verse; in other words, no meter, no rhyme scheme. Meter and rhyme offer the same opportunities for problem-solving. We have seen the rules/templates that determine whether or not two sequences rhyme. The delight, presumably, comes in making a determination with the use of those templates. In the work of poets like Dr. Seuss and Edgar Allan Poe, rhyme offers an abundance of opportunities for problem-solving, and the delight comes in the novel ways in which poets have chosen to rhyme.

Green Eggs and Ham

Do you like green eggs and ham?

Downloaded from http://direct.mit.edu/books/book-pdf/2437419/book_9780262356947.pdf by guest on 21 November 2024

I do not like them, Sam-I-am.
I do not like green eggs and ham!

The Raven
"Surely," said I, "surely *that is* something at my window *lattice*;
Let me see, then, what *thereat is*, and this mystery explore—

Dropping meter and rhyme leaves only the line ending. But the line ending offers no occasion for problem-solving. It is where the carriage happens to return. The reader can ponder, Why there? But there will be no shared rule system to help find the answer.

Because free verse qua verse is a visual art form, as opposed to metrical verse, the opportunities it affords for problem-solving now rest almost entirely on the poem's meaning—and, as we have seen, unlike meter and rhyme, meaning can be frustratingly private. From this perspective, it is clear where the source of Robert Frost's contempt for free verse lies.

Downloaded from http://direct.mit.edu/books/book-pdf/2437419/book_9780262356947.pdf by guest on 21 November 2024

7

Rules of Tonal Music: Grouping, Tonal, and Metrical

In their seminal book *A Generative Theory of Tonal Music* (1983), Fred Lerdahl and Ray Jackendoff take the position that in order to understand music, the listener must share rules with the composer. Here, too, the situation is parallel to natural language, where speaker and hearer share the same set of rules.[1]

What is remarkable about the exchange is that it takes place completely in the minds of the purveyor and the consumer. Whether the notes issue from a single instrument—say, the human voice—or an entire symphony orchestra, the musicians are perturbing the air molecules between themselves and the listeners. These molecules reach the inner ear, where they are analyzed by anatomical receptors and sent to the brain, which imposes structure. That is where the rules come in. It is well-known that music consists of sounds, rhythmical units, keys, and techniques like consonance, dissonance, and resolution. But none of these are in the real world any more than the sound /b/ is in the real world. Like the sounds of one's language, the sounds of music are mental constructs, and the means that give rise to those mental constructs are rules.

This is how Lerdahl and Jackendoff (1983, 2) see it:

> Where, then, do the constructs and relationships described by music theory reside? The present study will justify the view that a piece of music is a mentally constructed entity, of which scores and performances are partial representations by which the piece is transmitted. One commonly speaks of musical structure for which there is no direct correlate in the score or in the sound waves produced in performance. One speaks of music as segmented into units of all sizes, of patterns of strong and weak beats, of thematic relationships, of pitches as ornamental or structurally important, of tension and repose, and so forth. Insofar as one wishes to ascribe some sort of "reality" to these kinds of structure, one must ultimately treat them as mental products imposed on or inferred from the physical signal. In our view, the central task of music theory

Downloaded from http://direct.mit.edu/books/book-pdf/2437419/book_9780262356947.pdf by guest on 21 November 2024

> should be to explicate this mentally produced organization. Seen in this way, music theory takes a place among traditional areas of cognitive psychology such as theories of vision and language.

Lerdahl and Jackendoff (1983; see also Jackendoff and Lerdahl 2006) present their rules for understanding music in great detail. I briefly touch upon them here. I focus on emphasizing that there are rules, parallel to metrical rules, that enable us to understand music. While my overview is by no means complete, it should give a clear idea of the musical grammar that lies behind one's ability to assign structure to a piece of music.

The first kind of rule accounts for the human ability to gather a sequence of notes into groups (represented by the bracketed lines underneath the musical staff in figure 7.1). These rules chunk musical sequences into phrases—for example, "Happy birthday to you" or "Drink to me only with thine eyes." Lines a and b in the figure contain the same notes. In line a, the grouping occurs according to similarity of notes. The first three notes are the same. The next four notes are different from the first three, but all the same as each other. The same is true of the third group and the fourth. The idea is that similarity of notes is a basic principle for grouping. All else being equal, like notes form groups.

Line b in the figure is made up of the same notes but with a difference. Between the fourth and the fifth notes, a rest has been introduced. As indicated, this has altered the grouping. The claim is that rests tend to introduce boundaries and that notes preceding them will be grouped.

Line c demonstrates a different principle: namely, sharp differences of tonality. Thus, in establishing boundaries, the difference in tonal height

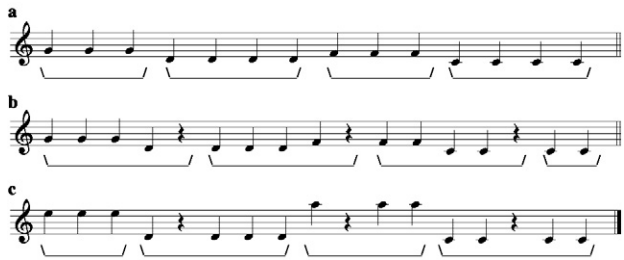



Figure 7.1
Application of the gestalt principles of proximity in the assignment of grouping structure. From Ray Jackendoff and Fred Lerdahl, "The Capacity for Music: What Is It, and What's Special about It?" *Cognition* 100, no. 1: 39.

Downloaded from http://direct.mit.edu/books/book-pdf/2437419/book_9780262356947.pdf by guest on 21 November 2024

between the first three notes and the fourth note is enough to overcome the role of a rest.

Since the position I am arguing for is that rules are shared between artists and their audiences, one wonders if there is any independent corroboration for the rules Lerdahl and Jackendoff propose. The answer is yes. Irene Deliège (1987) conducted experiments designed to test the psychological reality of the grouping rules.[2] Here is part of her conclusion (p. 356):

> Both experiments have allowed us to observe that Lerdahl and Jackendoff's grouping preference rules constitute theoretical principles backing up strongly the grouping intuitions of a subject while hearing music. The validity of those rules, though, proved to be more homogeneous in the musicians. The notion of "experienced listener" proposed by the authors would to that extent be justified.
>
> However, segmentation of the group into subgroups does not necessarily demand musical training. It can be seen indeed that, except for the rules depending more on the performance of the player, segmentations can be mostly made in accordance with the rules by the nonmusicians. The grouping preference rules might thus be considered to apply broadly, after all.

When it comes to the rules governing the tonal system, Jackendoff and Lerdahl (2006, 45) say:

> In a tonal system … every note of the music is heard in relation to a particular fixed pitch, the tonic or tonal center. The tonic may be sounded continuously throughout a piece, for instance by a bagpipe drone or the tamboura drone in Indian raga; or the tonic may be implicit.

They could, as well, have included the Aboriginal didgeridoo alongside the bagpipe and the tamboura as examples of instruments producing a tonic drone.

They represent the pitch space associated with the tonal center as shown in figure 7.2.

The rules specify how a tone-centered music divides the space between octaves into chordal intervals, that is, a third, a fifth, a dominant seventh, and so forth.

As with grouping, there is an extensive literature arguing for the universality of scales. For example, Isabelle Peretz (2006, 7) notes:

> Psychologists were the first to point out that tonal scale systems are almost universal in the music of the world's cultures. Dowling and Harwood (1986, pp. 90–91) found only a handful of cultures in which the pitches used in singing did not provide evidence of scale steps. The overwhelming majority of

Downloaded from http://direct.mit.edu/books/book-pdf/2437419/book_9780262356947.pdf by guest on 21 November 2024

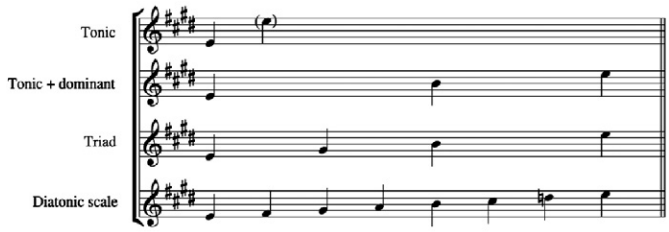



Figure 7.2
How pitch space is associated with the tonal center. From Ray Jackendoff and Fred Lerdahl, "The Capacity for Music: What Is It, and What's Special about It?" *Cognition* 100, no. 1: 46.

> cultures use stable musical scales that share several general properties: (1) discrete pitch levels, (2) octave equivalence, (3) a moderate number (usually 5–7) pitches within the octave, which are repeated through different octaves, (4) a tonal hierarchy in which certain pitches function as stable points of melodic resolution and others as contrasting unstable points (Dowling & Harwood, 1986; Dowling, 1999, 2001).

Kamraan Gill and Dale Purves (2009) suggest that the universality of scales has a biological basis:

> The analyses we report here show that many of the relatively small number of scales that humans have preferred over history and across cultures comprise intervals that when considered as a set are maximally similar to harmonic series. The basis for these results may be a preference for the biologically significant spectral features that characterize conspecific vocalizations.

They suggest further that

> the presence of a harmonic series is a salient feature of human vocalizations and essential to human speech and language. It follows that the similarity of musical intervals to harmonic series provides a plausible biological basis for the worldwide human preference for a relatively small number of musical scales defined by their overall similarity to a harmonic series.

The intention behind this comment is not only to provide a biological explanation for scales but also to suggest a connection between the human ability to make music and the human ability to speak. My assumption throughout this book—that there is a natural aesthetic based on rule systems that reflect what the human brain does naturally—does not require that these rule systems share modules, although this is quite possible and even likely.

Downloaded from http://direct.mit.edu/books/book-pdf/2437419/book_9780262356947.pdf by guest on 21 November 2024

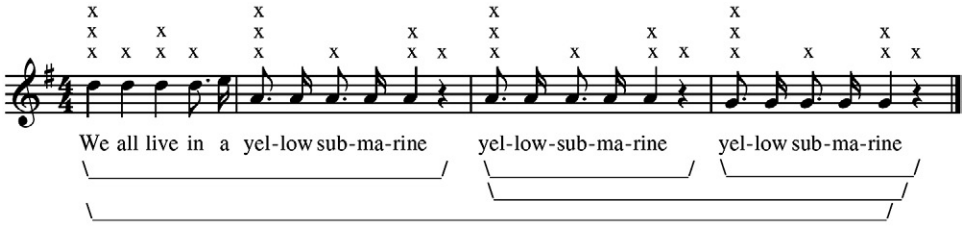


Figure 7.3
The first phrase of *Yellow Submarine* with its metrical and grouping structures. From Ray Jackendoff and Fred Lerdahl, "The Capacity for Music: What Is It, and What's Special about It?" *Cognition* 100, no. 1: 40.

For example, consider the next set of rules, those that assign metrical structure to the musical surface. Metrical structure is illustrated in figure 7.3 along with grouping structure. As Jackendoff and Lerdahl (2006, 40) point out:

> The basic unit of metrical structure is a beat, a point in time usually associated with the onset of a note in the musical surface. Beats are combined into a metrical grid, a hierarchical pattern of beats of different relative strengths.

Like Jackendoff and Lerdahl, others (see, e.g., Fitch 2006) have observed that the metrical grid that accounts for the placement of stress in English words is homologous with the metrical grid that accounts for the placement of weak and strong beats in a musical composition, the major difference being that music is isochronous (i.e., made up of equally spaced intervals) whereas stress placement in natural language is not (e.g., the number of syllables between stresses in a word varies).

In the same way that metrical rules locate strong and weak beats in a piece of music, the stress rules of English assign strong and weak stresses within a word. Within a word, stress is not isochronous. However, poetry and music both share isochrony. Once again there is a strong similarity between two separate cognitive abilities, stress placement in music and language. But once again this only shows that the computations involved are natural ones.

But while we are on the subject of parallels, we are now in a position to see how constraints can give rise to different art forms within the domains of music and language. In the previous chapter, we saw that stripping away constraints produces different poetic forms. Now let's look at what happens if we add constraints.

Downloaded from http://direct.mit.edu/books/book-pdf/2437419/book_9780262356947.pdf by guest on 21 November 2024

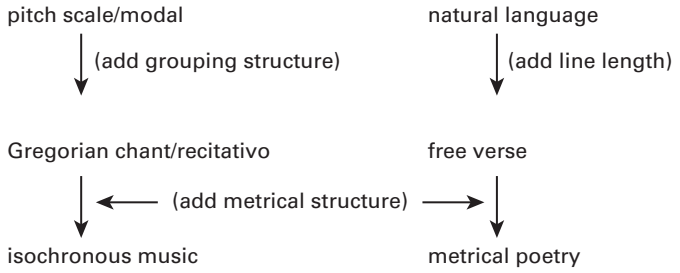


Figure 7.4
Parallel constraints on music and language and their outcomes

The chart in figure 7.4 shows what happens when constraints are added to tonal music on the left and natural language on the right. Thus, if we constrain the content of tonal music and language by rules of grouping only, then in music we get Gregorian chant, a form of music in which isochrony plays no role at all. We also get an art form known as operatic recitativo, where ordinary speech is sung but without any sense of musical metrical constraint.

The counterpart to Gregorian chants and recitativos in poetry is free verse, the verse form in which repetitive metrical units play no role. If, as the chart in figure 7.4 suggests, we further constrain the art form by adding metrical rules, in music we get isochronous music of the typical classical variety and on the natural language side of the ledger we get the metrical poetry that dominated English for so long.

A form of poetry associated with the Dada movement bears some similarity to Gregorian chant, at least with respect to the use of musical structure. The Dada poet Hugo Ball wrote poetry composed of meaningless syllables, so-called sound poetry. It was the poetic counterpart of scat singing in jazz, which predated sound poetry by at least a decade.[3] Here is one such poem written by Ball in 1916:

Karawane
jolifanto bambla o falli bambla
großiga m'pfa habla horem
égiga goramen
higo bloiko russula huju
hollaka hollala
anlogo bung
blago bung blago bung
bosso fataka

Downloaded from http://direct.mit.edu/books/book-pdf/2437419/book_9780262356947.pdf by guest on 21 November 2024

ü üü ü
schampa wulla wussa ólobo
hej tatta gôrem
eschige zunbada
wulubu ssubudu uluw ssubudu
tumba ba- umf
kusa gauma
ba—umf

In his Dada Manifesto of 1918, Tristan Tzara declared, "I am against systems, the most acceptable system is on principle to have none." It is not so easy to escape systems. "Karawane" has to be pronounced, and that means the phonological inventory of the speaker has to be engaged. That inventory is part of a system. In one performance,[4] the players place the poem within a musical system by raising and lowering the pitch on each phrase in a fashion consistent with the rules of pitch scale structure. They turn it into a kind of Gregorian chant in spite of themselves.[5] In a striking performance of the poem, country music singer Marie Osmond moved unexpectedly outside the box for which she was famous when she delivered "Karawane" as if it were an angry speech. Here the prosodic system of spoken English kicks in with a vengeance. And in 2014, Esa-Pekka Salonen conducted an orchestra-backed chorus singing the poem in what can be seen as a rare example of classical scat singing. It is as if a piece of art without a system is like a vacuum. Nature abhors them both.

Downloaded from http://direct.mit.edu/books/book-pdf/2437419/book_9780262356947.pdf by guest on 21 November 2024

Downloaded from http://direct.mit.edu/books/book-pdf/2437419/book_9780262356947.pdf by guest on 21 November 2024

8

The Rules of Mimetic Art

In *Art and Illusion,* E. H. Gombrich (1956, 182) cites the following dialogue between Apollonius of Tyana (first century AD) and his disciple, Damis, as recorded by Philostratus. After agreeing that painting is the art of imitation, of mimesis, Apollonius asks:

> "[B]ut what about the things we see in the sky when the clouds are drifting, the centaurs and stag antelopes and wolves and horses? Are they also works of imitation? Is God a painter who uses his leisure hours to amuse himself in that way?" No, the two agree, these cloud shapes have no meaning in themselves, they arise by pure chance; it is we who by nature are prone to imitation and articulate these clouds. "But does this not mean," probes Apollonius, "that the art of imitation is twofold? One aspect of it is the use of hands and mind in producing imitations, another aspect the producing of likenesses with the mind alone?" The mind of the beholder also has its share in the imitation.

What Apollonius is saying is that human beings have built-in pattern recognizers and that the artistry behind representational (i.e., mimetic) art is the ability to put marks and scratches on a canvas in such a way that those pattern recognizers are triggered just as a cloud formation might trigger a built-in face recognition device. (This must surely have been what Andrea Mantegna had in mind in 1507 when he painted the cloudscape in *Minerva Expelling the Vices from the Garden of Virtue*; see figure 8.1a. Look carefully at the upper cloud formation to the left of center in figure 8.1b—another Easter egg.) As far back as the time of Christ, the symbiotic relationship between what a viewer is hardwired to see and what an artist can elicit from a viewer was understood. It is an obvious point, really. In looking at a painting, the viewer brings something of his or her own to the table. It is in part the mind of the viewer that triggers the man in the moon, the *Mona Lisa*, or the recognition of a friend's face in a crowd. The skilled artist manipulates that recognition.

Downloaded from http://direct.mit.edu/books/book-pdf/2437419/book_9780262356947.pdf by guest on 21 November 2024

(a)

(b)

Figure 8.1
(a) Andrea Mantegna, *Minerva Expelling the Vices from the Garden of Virtue*, circa 1502. (b) Detail.

Downloaded from http://direct.mit.edu/books/book-pdf/2437419/book_9780262356947.pdf by guest on 21 November 2024

In fact, the history of mimetic art can be seen as one in which artists were cognitive scientists of a sort, working to discover techniques that would endow the two-dimensional surface of a painting with a three-dimensional look into the brain. In essence, this entails coming up with hypotheses about how the brain interprets what the human eye sees.[1] It is no accident that Piero della Francesca, one of the great Renaissance painters, wrote *On the Perspective of Painting*.

In an article in *Dædalus,* British neurobiologist Semir Zeki (1998, 72) makes these suggestive comments:

> Why do we see at all? It is the answer to that question that immediately reveals a parallel between the functions of art and the functions of the brain, and indeed ineluctably drives us to another conclusion—that the overall function of art is an extension of the function of the brain. In that definition are the germs of a theory of art that has solid biological foundations and that unites the views of modern neurobiologists with those of Plato, Michelangelo, Mondrian, Cézanne, Matisse and many other artists. …
>
> I will therefore define the function of art as being a search for constancies, which is also one of the most fundamental functions of the brain. The function of art is therefore an extension of the function of the brain—the seeking of knowledge in an ever-changing world.

All this raises the question: what are the constancies? I believe the basis for an answer is forthcoming in the work of Nancy Kanwisher, Josh McDermott, and Marvin Chun (1997). Reporting on an experiment using functional magnetic resonance imaging (fMRI) to record participants' reactions to faces and various common objects, they state (p. 4310):

> The import of our study is threefold. First, it demonstrates the existence of a region in the fusiform gyrus that is not only responsive to face stimuli … but is *selectively* activated by faces compared with various control stimuli. Second, we show how strong evidence for cortical specialization can be obtained by testing the responsiveness of the same region of cortex on many different stimulus comparisons. … Finally, the fact that special-purpose cortical machinery exists for face perception suggests that a single general and overarching theory of visual recognition may be less successful than a theory that proposes qualitatively different kinds of computations for the recognition of faces compared with other kinds of objects.

Follow-up studies (e.g., Grill-Spector, Knouf, and Kanwisher 2004) have confirmed and enhanced the role of the fusiform face area (FFA) in face detection and identification (p. 559):

> Thus, our data show that the FFA responses correlated with, and hence are probably involved in, both the detection and identification of faces.

Downloaded from http://direct.mit.edu/books/book-pdf/2437419/book_9780262356947.pdf by guest on 21 November 2024

Eric Kandel (2012, 301) provides a superb summary of work on face recognition in the brain. Part of that summary includes the following important observation:

> One reason for our figural and emotional response to faces in art is the important role that face perception plays in social interactions, emotion, and memory. *Indeed, face perception has evolved to occupy more space in the brain than any other figural representation* [italics mine].

R. Jenkins, A. J. Dowsett, and A. M. Burton (2018) argue that the average person recognizes 5,000 separate faces and that in some cases that number might even double or triple. This is a remarkable fact, especially since, from a practical point of view, the number of faces one needs to recognize in terms of "social interaction" is much smaller, probably in the neighborhood of 125. It is even more remarkable when we consider that the stimuli the authors used were photographic images of faces and not the marks and scratches in paintings like Georges Braque's *Femme tenant une mandoline* or Pablo Picasso's *Girl with a Mandolin* (see chapter 11). The ability to recognize 5,000 faces is rather like one's ability to recognize 5,000 words or 5,000 sentences in English. That is to say, it is infinite.[2]

The discovery of portions of the cerebrum dedicated to specific cognitive functions goes beyond face identification to a selective response to the human body and body parts. As Paul Downing and colleagues (2001, 2470) report:

> We present a series of functional magnetic resonance imaging (fMRI) studies revealing substantial evidence for a distinct cortical region in humans that responds selectively to images of the human body, as compared with a wide range of control stimuli. This region was found in the lateral occipitotemporal cortex in all subjects tested and apparently reflects a specialized neural system for the visual perception of the human body.

They further conclude (p. 2472):

> [Our] results reveal a region in human lateral occipitotemporal cortex that responds selectively to visual images of human bodies and body parts, with the exception of faces. These findings suggest that the EBA [extrastriate body area] is a specialized system for processing the visual appearance of the human body.

They leave open the question of whether or not this "privileged category" is part of the human genetic endowment or part of a learned skill.

Downloaded from http://direct.mit.edu/books/book-pdf/2437419/book_9780262356947.pdf by guest on 21 November 2024

Kandel (2012, 302) takes note of this work when he points to the importance of the extrastriate body area in our reaction to painting:

> Brain imaging studies by Kanwisher (2001)[3] first revealed that neurons in the extrastriate body area, a region of the occipital lobe, respond selectively to images of the human body. Indeed, images of bodies or parts of bodies are quite powerful and capture our attention even when we are focused on another task. *This might be an important factor in the historical dominance of figurative art* [italics mine].

Elsewhere (2012, 339), he observes:

> Functional MRI has revealed that the brain's response to the entire body is somewhat stronger than its response to the hands.

Finally (2012, 413), he says:

> These regions of the brain, particularly the extrastriate body area concerned with information about another person, are thought to serve as a gateway for higher social cognition.

Alongside face recognition, then, body recognition is an especially privileged category of human cognition.

Russell Epstein and Lindsay Vass (2015 n.p.) undertook a study that focused on another privileged category:

> [T]he brain … appears to rely … on a specialized mechanism for landmark recognition, analogous in many ways to the specialized mechanism that is believed to support face recognition. The primary neural locus of this mechanism is the parahippocampal place area (PPA)—a region in the collateral sulcus near the parahippocampal/lingual boundary that exhibits a strong functional magnetic resonance imaging (fMRI) response when subjects view environmental stimuli, such as buildings, streets, rooms and landscapes. … By contrast, the PPA only responds weakly when subjects view common everyday objects, such as vehicles, tools and appliances, and it does not respond at all when they view faces. Notably, the PPA exhibits this strong preference for environmental stimuli even when subjects simply view stimuli passively without performing any explicit navigational task. …
>
> An especially salient kind of landmark is the geometric arrangement (i.e. spatial layout) of the major surfaces of the local scene. Several lines of evidence indicate that the PPA might be concerned with processing this kind of information. The PPA responds strongly to images of empty rooms containing little more than bare walls, which contain no discrete objects but depict a three-dimensional space as defined by fixed background elements. … It also responds strongly to 'scenes' made out of Lego blocks that have a similar geometric organization … even when they are perceived haptically rather than visually. … Further, multi-voxel pattern analysis (MVPA) studies have found that the PPA distinguishes between scenes based on their geometric features,

Downloaded from http://direct.mit.edu/books/book-pdf/2437419/book_9780262356947.pdf by guest on 21 November 2024

> with distinct activity patterns elicited by open vistas (e.g. a highway stretching through an open desert) and closed-in scenes (e.g. a crowded city street). … Finally, PPA response to scenes is greater when subjects judge the location of a target object relative to the fixed architectural elements in the scene than when they judge its location relative to a movable object or the viewer, thus demonstrating a role for the PPA in the processing of environment-centered spatial relationships.

Anjan Chatterjee (2014, 25) summarizes this functional aspect of the brain as follows:

> Even though our eyes are in the front of our head, visual information goes to the back of our brain, into the occipital lobes. Different parts of the back of the brain are tuned to different parts of our visual world, such as color, shape, and contrast. These parts of vision are then combined into more complex objects, such as *faces and bodies and landscapes* [italics mine], each with its own special area in the brain. These specialized areas are examples of the modular organization of the brain.

Since the early studies cited above, a number of follow-up studies using a variety of techniques have yielded the same results.[4] These are just a few examples from an abundant literature suggesting that there are areas in the brain devoted specifically to face, place, and body recognition. These are the constancies that Zeki speaks of, the built-in recognizers that Apollonius of Tyana implied and that artists have learned to s(t)imulate. The implications of these discoveries for the visual arts was not lost on Kanwisher. At a 2007 symposium on art and the brain at the University of Illinois, after outlining the results of several studies on functional regions of the brain in a PowerPoint presentation, she displayed a slide labeled "Hypotheses":

> The functional organization of the visual brain provides clues about fundamental dimensions of visual experience.
>
> Specifically, perhaps the visual categories that feature most prominently in the organization of the brain play a special role in our visual experience of the world and of visual art.

(The PowerPoint presentation—which Nancy Kanwisher shared with me in a personal communication—was never published, but the hypothesis appears elsewhere (e.g., in Kandel 2016).)

Following Kanwisher's hypothesis, I suggest that these privileged categories represented in various areas of the brain—the FFA, PPA, and EBA—are the counterparts of the shared rule systems of metrical poetry

Downloaded from http://direct.mit.edu/books/book-pdf/2437419/book_9780262356947.pdf by guest on 21 November 2024

and of tonal music.[5] Chatterjee (2014, 52) argues that these privileged categories of face, place, and body are not merely the result of neuronal categorizing—they are also associated with evaluation. That is to say, recognition by the face, place, and body modules of the brain is also associated with an aesthetic. That, in fact, is the central notion behind *The Aesthetic Brain*. Chatterjee argues that associated with face recognition is a sense of what constitutes an attractive face; similarly for bodies and landscapes, contributing to a sense of beauty associated with these categories:

> Five principles underlie our sense of beauty in people and places. First, similar to faces and bodies, our preferences for places are partly hard-wired. We prefer vistas that resemble savannas even if we have never visited such a place. These preferences are then modified by later personal experiences. Second, our Pleistocene ancestors who were drawn to places that also happened to improve their chances of survival passed on these tastes in what we now regard as beautiful. Natural selection rather than sexual selection played the dominant role in the evolution of place preferences. Third, the brain's responses to beautiful landscapes involve neuronal ensembles in the visual cortex that classify environments, and these areas fire together with neurons in reward systems. It is too early to be sure, but the evidence suggests that our visual brain not only classifies things, it also evaluates them. Fourth, we respond to fitness indicators. In faces, these could be big eyes, full lips, or square jaws. In landscapes these are trees that indicate a beautiful environment or flowers that promise rich sources of nutrition. Fifth is the role of enhancements. We saw earlier that cosmetics have played a long role in human history. Generally, cosmetics, including invasive plastic surgery, enhance physical features that we evolved to find attractive. Is there anything analogous to human environmental creations? Gardens are examples of landscape enhancements. They are designed to delight and give pleasure. They often exaggerate the aspects of natural landscapes that we find beautiful, by leaving open places, multiple vantage points, partially hidden paths, and flowers that signaled the promise of bounty.

If Chatterjee is right, then it is not surprising that for so many thousands of years, art has centered around faces, places, and bodies. Nor is it surprising that a major thrust among artists has been to represent these aspects of our humanity as accurately as possible so as to stimulate the sense of beauty associated with those categories. Indeed, riffing on Chatterjee's fifth principle, the history of Western art from cave paintings to the end of mimetic art is a form of enhancement, just like gardens, cosmetics, and bodybuilding.

Downloaded from http://direct.mit.edu/books/book-pdf/2437419/book_9780262356947.pdf by guest on 21 November 2024

In her book *Venus in Exile: The Rejection of Beauty in 20th-Century Art*, Wendy Steiner (2001, xv) opens her discussion of the retreat from feminine beauty initiated by the onset of modernism with this comment:

> In modernism, the perennial rewards of aesthetic experience—pleasure, insight, empathy—were largely withheld, and its generous aim, beauty, was abandoned. Modern artworks may often have been profoundly beautiful, but theirs was a tough beauty, hedged with deprivation, denial, revolt. "Contemporary aesthetics has established the beauty of ugliness," Mario Vargas Llosa tells us, "reclaiming for art everything in human experience that artistic representation had previously rejected."

Steiner argues that the modernists rejected female beauty and discusses the consequences of that rejection. She takes as the iconic emblem of her argument Russell Connor's *New Yorker* cover (November 23, 1992) picturing his renditions of John Singer Sargent's *Madame X* (1884) and Picasso's *Girl before a Mirror* (1932) pointedly staring past one another (see figure 8.2). What is important about this cover is that while the shift in the depiction of beauty between Sargent and Picasso is clear, both images depend upon the fusiform gyrus and the extrastriate body area for recognition. In both cases, there is no doubt we are looking at the head and torso of a woman. The point here is that while the shift from one image to the other that took place over almost half a century was stylistically extraordinary, it was also superficial. From the point of view of dedicated categories of the brain, nothing much changed. It was rather like the shift from the body of a Model T to that of a Corvette: *plus ça change, plus c'est la même chose*.

While it is true that much art of the modern period took a direction in which the privileged categories of face, place, and body had disappeared, there were halfway houses. The expressionist painters Gustav Klimt, Egon Schiele, and Oskar Kokoschka, for example, twisted, turned, stretched, shrank, and in general distorted the privileged categories of body and face as rendered by representational art. Their paintings were like reflections in a funhouse mirror. But they never abandoned those categories altogether. Their portraits were recognizable as portraits. To that extent, they remained within the mimetic tradition when viewed as art designed to elicit FFA, PPA, and EBA activity.

Kandel (2012) sees their distortions expressing the inner emotional state of the subject. Of course, Rembrandt was a master of just that but he didn't avail himself of distortion. He chose other means, such

Downloaded from http://direct.mit.edu/books/book-pdf/2437419/book_9780262356947.pdf by guest on 21 November 2024

Figure 8.2
Russell Connor, *New Yorker* cover, November 23, 1992. The cover shows Connor's rendition of Pablo Picasso's *Girl before a Mirror*, 1932, and John Singer Sargent's *Madame X*, 1884.

as chiaroscuro. What made the expressionists distort? My guess is that the abandonment of the natural aesthetic licensed all sorts of (radical) departures from traditional mimesis, and this was true not just for the expressionists but for all the major modernist movements we cherish—the impressionists, the cubists, the fauvists, and so on. Like Mahler and his Tenth Symphony, they pushed against the boundaries, but they did not overstep them.[6]

Others, of course, did—constructivism, Dadaism, suprematism, tachism, and vorticism, to name a few. Artists of these persuasions often abandoned the privileged categories of FFA, PPA, and EBA. Some of

Downloaded from http://direct.mit.edu/books/book-pdf/2437419/book_9780262356947.pdf by guest on 21 November 2024

them—for example, Mondrian—emphasized other built-in categories such as line recognition and color.[7]

Perhaps the most famous school of modernist painting that apparently abandoned the natural aesthetic is abstract expressionism. We will explore the work of its premier practitioner, Jackson Pollock, later in the book. He clearly replaced the privileged categories of face, place, and body with a private format, but, as we will see, with a remarkable twist.

Art historians generally divide the period of Western art into three broad eras: the mimetic period, the modern period, and postmodernism. The philosopher-turned-art-critic Arthur Danto (1995, 47) describes the overall history in these terms:

> [T]he master narrative of the history of art—in the West but by the end not in the West alone—is that there is an era of imitation, followed by an era of ideology, followed by our own post-historical era in which, with qualification, anything goes. Art criticism in the traditional or mimetic period was based on visual truth. The structure of art criticism in the age of ideology is the one from which I sought to disengage myself: it characteristically grounded its own philosophical idea of what art is on an exclusionary distinction between the art it accepted (the true) and everything else as not really art.

The so-called era of imitation could easily extend back into ancient Greek, Roman, and Egyptian art. In fact, one might push the era of imitation all the way back some 20,000 years or so to the cave paintings of Lascaux. Mimesis reigns. In that case, one might even ask why the entire Western history of art going back to cave paintings started with representation rather than with more abstract forms of art. In terms of the thesis being presented here, the reason is that representation was the "natural" starting point.[8] I choose the thirteenth century as an arbitrary moment in the timeline since I have to start somewhere and since I consider what I have to say applicable throughout the history of art.

During the era of imitation from Cimabue in the thirteenth century to Ernest Meissonier in the nineteenth, the functional brain areas of face, place, and body performed for painting what meter and tonality performed for poetry and music. To put it in neurological terms, for at least 700 years artists constructed images that catered to the fusiform gyrus (face), the parahippocampal (place), and the extrastriate (body) areas of the brain. This would account for the directionality of modernism. That is to say, without resort to privileged categories, one might wonder why

Downloaded from http://direct.mit.edu/books/book-pdf/2437419/book_9780262356947.pdf by guest on 21 November 2024

Figure 8.3
Painting created following American interviewees' preferences in art, as part of Vitaly Komar and Alexander Melamid's Most Wanted Paintings project

cubism, impressionism, abstract expressionism, and all the other -isms that succeeded the end of traditional representation followed rather than preceded mimetic art.

The Russian conceptual artists Vitaly Komar and Alexander Melamid—inadvertently, I think—exploited this universal property of privileged categories in their Most Wanted Painting gambit. They hired marketing firms in 11 countries including the United States, Russia, China, France, and Kenya to determine interviewees' preference in art. Remarkably, the results were pretty much the same no matter what the culture. Figure 8.3 shows a painting they created out of American preferences, and figure 8.4, John Constable's *Wivenhoe Park*. No wonder Constable's painting plays a major role in Gombrich's exposition.[9]

Figures 8.5–8.11 provide a sample of paintings from the thirteenth through nineteenth centuries, all of which cater to the privileged categories of face, place, and body. As time passed, of course, artists added techniques that enhanced the magic of giving two-dimensional space the look of three. Just see how the army following Napoleon in figure 8.11 recedes in the distance. It is a remarkable effect when you consider that

Downloaded from http://direct.mit.edu/books/book-pdf/2437419/book_9780262356947.pdf by guest on 21 November 2024

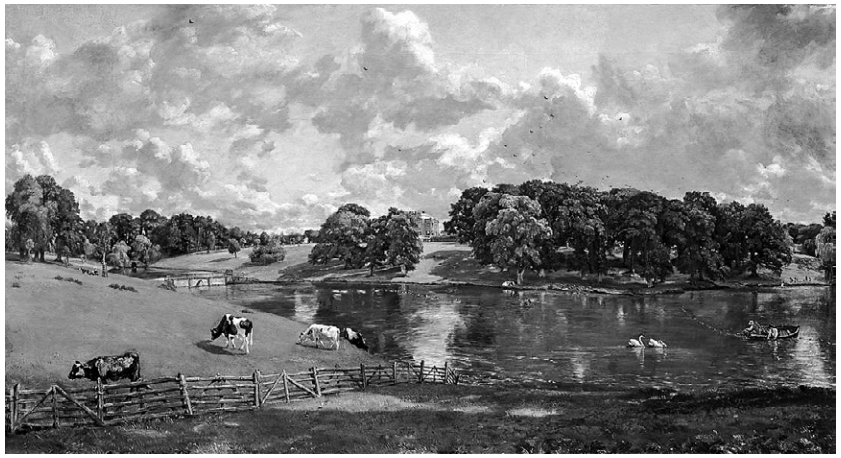


Figure 8.4
John Constable, *Wivenhoe Park*, 1816

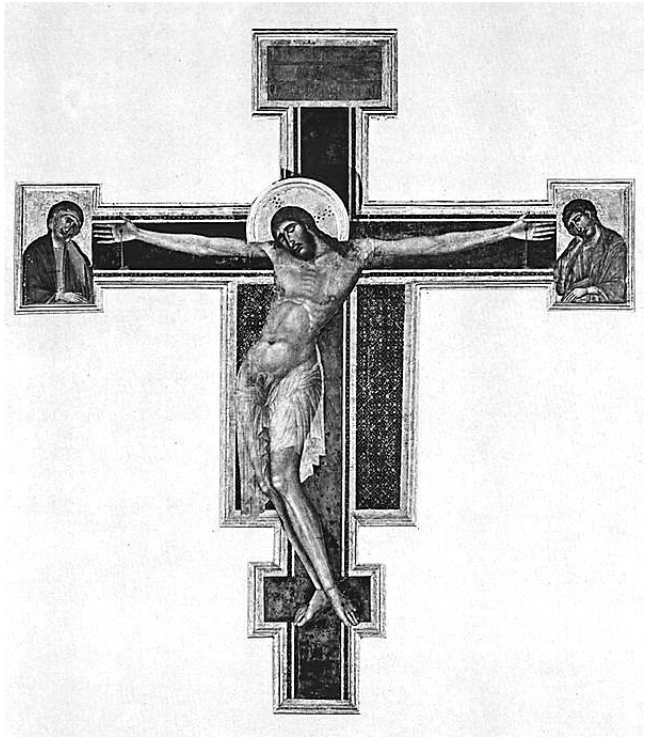


Figure 8.5
Cimabue, *Crucifix*, 1288

Downloaded from http://direct.mit.edu/books/book-pdf/2437419/book_9780262356947.pdf by guest on 21 November 2024

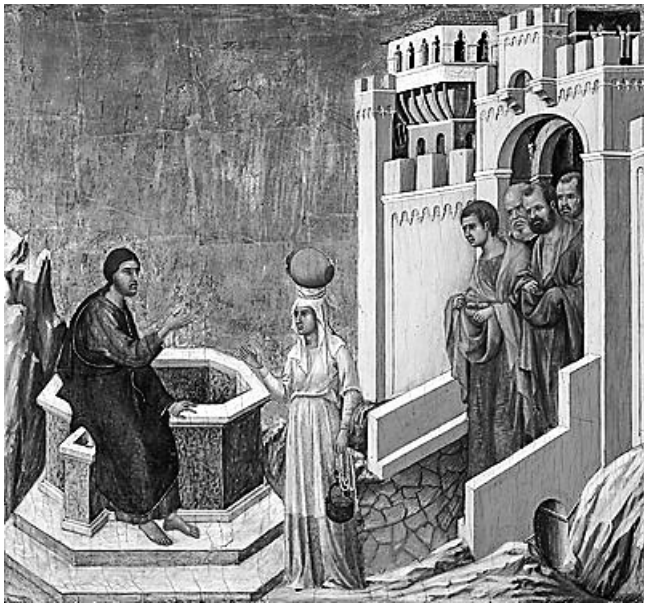


Figure 8.6
Duccio di Buoninsegna, *Christ and the Samaritan Woman*, 1310–1311

it consists of nothing but darker and lighter swatches of paint. You can stare at that receding line of horsemen until the Musée d'Orsay closes, but it is virtually impossible to see it for what it is, paint tailing away on a flat canvas.

Over the course of time, the flatness of Cimabue (figure 8.5) and Duccio (figure 8.6) gave way to the depth perception of Piero della Francesca (figure 8.7) and Raphael (figure 8.8). Piero, a mathematician as well as an artist, wrote three treatises on mathematics including one, as previously noted, on perspective.

In Velázquez's *Las Meninas* (figure 8.9), the mirror on the far wall reflects the king and queen of Spain. Either they are standing outside the frame of the picture in a spot akin to the one the viewer is occupying or else the mirror reflects the portrait the artist is working on. To my eye, the former is the correct perspective since the Infanta Margaret Theresa, one of her maids of honor, and one of the attendant dwarfs are all following Velázquez's gaze toward the viewer, thereby drawing the viewer into the picture and increasing the sense of depth represented by the scene.

Downloaded from http://direct.mit.edu/books/book-pdf/2437419/book_9780262356947.pdf by guest on 21 November 2024

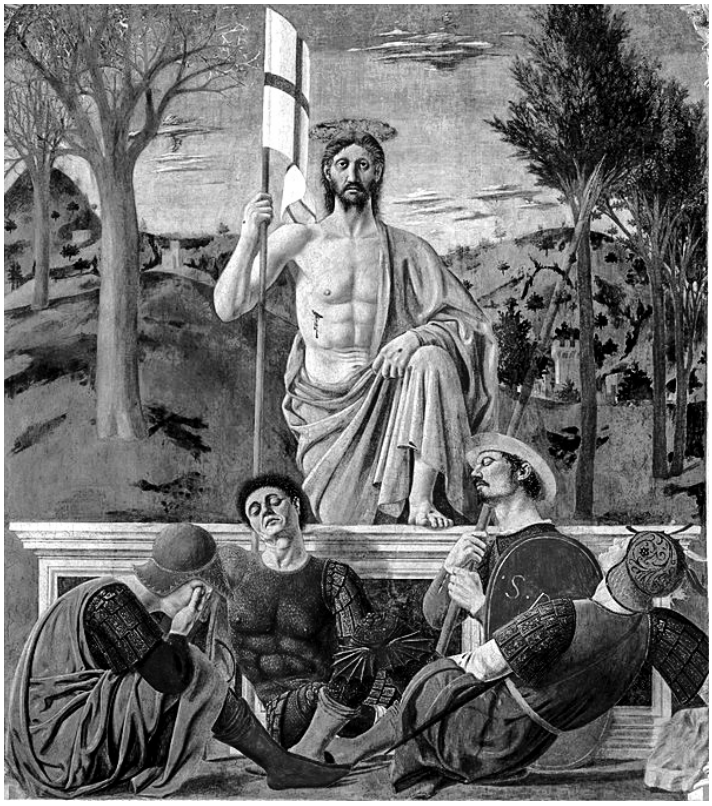


Figure 8.7
Piero della Francesca, *The Resurrection*, 1463–1465

The Necker cube plays a similar role in William Hogarth's *The Orgy* (figure 8.10). In figure 8.12, you can see the gray ball as either on the near upper left outside corner of the cube or on the far upper left inside corner. Now notice that the corner at the upper left-hand portion of Hogarth's painting is a portion of a Necker cube. It corresponds to perceiving the gray ball as being on the far upper left inside corner. This is how Hogarth has created the illusion of three-dimensional space inside a room.

If you block out enough of the painting to dissociate it from the scene in the room (see figure 8.13), what's left can be perceived as people inside a house looking out. You have to ignore the perspective lines of the paintings to make the jump, but that isn't hard to do. You can almost see the

Downloaded from http://direct.mit.edu/books/book-pdf/2437419/book_9780262356947.pdf by guest on 21 November 2024

Figure 8.8
Raphael, *Madonna of the Meadow*, 1505–1506

people following the external wall of a building. But adding the familiar objects of the larger room—the table, chairs, floor—enforces the internal perspective. This perspective now imposes a sense of depth on the picture and this, in turn, imposes a sense of size.

In particular, the Necker cube perspective forces us to view the female figure at the far left as being an adult figure of normal height, only farther away. In fact, if you were to superimpose her over the figure of the sprawled rake, she would fit in the space from the tip of his head to the middle of his thigh. The rake is not a giant. He just appears to be closer.

Downloaded from http://direct.mit.edu/books/book-pdf/2437419/book_9780262356947.pdf by guest on 21 November 2024

Figure 8.9
Diego Velázquez, *Las Meninas*, 1656

The Necker cube is rather like a visual pun. To see this, consider a verbal counterpart:

The setup:
A duck waddles into a pharmacy and says to the pharmacist, "I'd like a chapstick, please."
Straight man:
Raising an eyebrow, the pharmacist asks, "And how do you propose to pay for it?"
The punch line:
"Just put it on my bill."

The setup primes the listener for the "invoice" meaning of *bill*. The straight man reinforces the expected meaning. The punch line introduces the unexpected meaning that is the essence of the pun. The reason why I

Downloaded from http://direct.mit.edu/books/book-pdf/2437419/book_9780262356947.pdf by guest on 21 November 2024

Figure 8.10
William Hogarth, *The Orgy* (from *A Rake's Progress*), 1732–1733

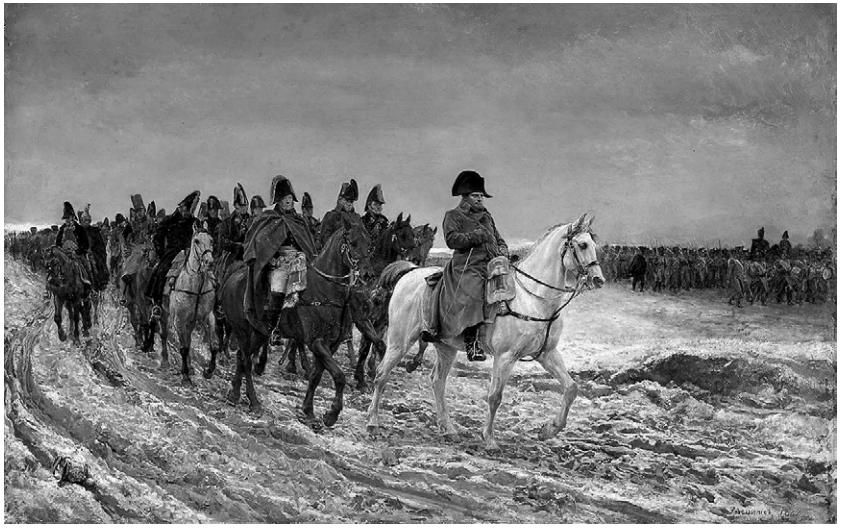


Figure 8.11
Ernest Meissonier, *Campaign of France, 1814*, 1864

Downloaded from http://direct.mit.edu/books/book-pdf/2437419/book_9780262356947.pdf by guest on 21 November 2024

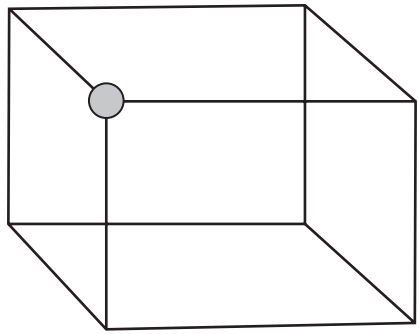


Figure 8.12
A Necker cube

Figure 8.13
William Hogarth, *The Orgy* (from *A Rake's Progress*), 1732–1733; detail

say that a Necker cube and a pun are alike is that in each case the same object has two different interpretations. That means they are both ripe for manipulation. In the case of the verbal pun, it is the word *bill* that has two interpretations. The pun arises because the setup forces one meaning while the punch line forces a different one. The appropriateness of each to its own cue is what one admires. Hogarth forces one interpretation of the Necker cube in order to impose perspective on the scene. Artists like M. C. Escher have created objects where the two perspectives are at war with one another and resolution is impossible (see figure 8.14).

Downloaded from http://direct.mit.edu/books/book-pdf/2437419/book_9780262356947.pdf by guest on 21 November 2024

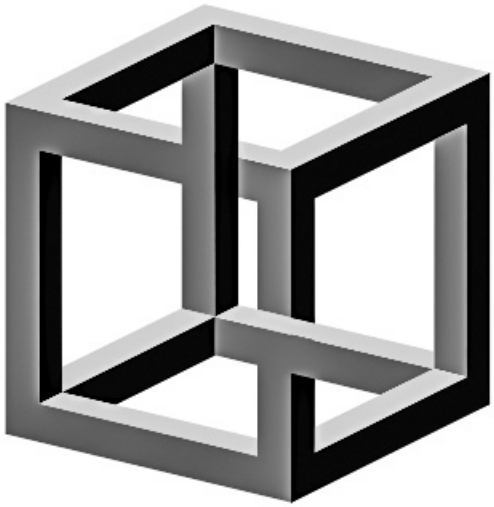


Figure 8.14
Impossible Necker cube illusion because of conflicting visual cues

The setup/punch line routine occurs visually as well. Take the *Rhymes with Orange* cartoon in figure 8.15. In the first panel, we see the familiar icon of a man crawling across a desert floor. The signpost labels his predicament. The desert color, the cloudless sky, the beard, the woeful expression, the ragged pants, the fact that the man is on all fours all conspire toward that representation. That is the visual setup. The second panel reinforces that interpretation but it is also setting up a second one. In the third panel, the horizontal line two-thirds of the way up, which divides the panel according to the golden mean, begins to offer the possibility of the second interpretation. The man stands up to inspect the horizon line. He has an idea. He acts on it. In the fourth and fifth panels, he grabs hold of what we were led to believe was a horizon line but which has been reinterpreted as a bowstring. The sixth and seventh panels reveal his plan. He has found a way to propel himself out of the desert. He only gets so far. The last panel is the punch line. That was not the sky he hurled himself toward.

The landscape in the last panel and in the first are identical. But what they represent has changed dramatically, just like the meaning of *bill* in the duck pun. Unlike the duck pun, there are two ambiguous objects in

Downloaded from http://direct.mit.edu/books/book-pdf/2437419/book_9780262356947.pdf by guest on 21 November 2024

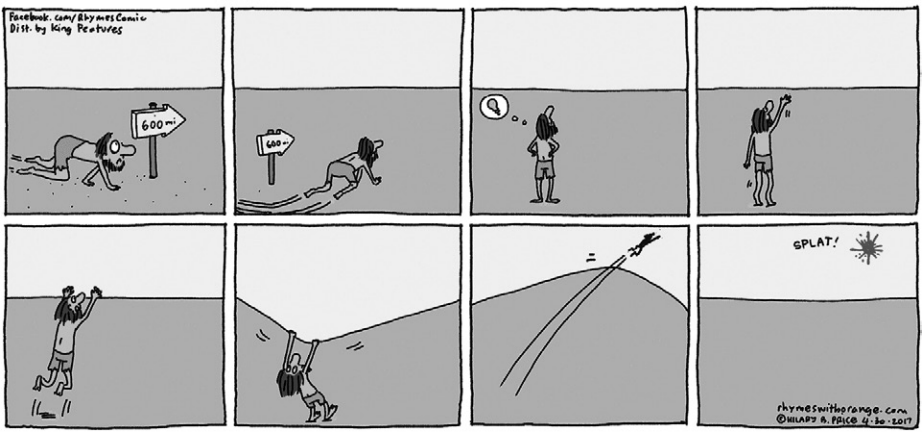


Figure 8.15
The visual counterpart of a verbal pun. Hilary Price, *Rhymes with Orange* © 2017 King Features Syndicate, Inc., Hearst Holdings, Inc.

the cartoon, the horizon line/bowstring and the sky/wall. The cartoon could have ended in the seventh panel. But the cartoonist exploits both ambiguities, handing the viewer a surprising double whammy.

Necker cubes, perspective lines, and objects reflected in mirrors do not by any means exhaust the techniques whereby artists encourage the constancies of the brain to do their work. In *Wivenhoe Park*, Constable uses the trick of articulating the trees in the foreground and just suggesting them with broad strokes in the distance. It is enough. Meissonier does the same thing in his depiction of the long line of horsemen following Napoleon. As Gombrich (1956, 220) describes this device:

> I believe that this illusion is assisted by what might be called the "etc. principle," the assumption we tend to make that to see a few members of a series is to see them all. When we look at the trees in Constable's *Wivenhoe Park* … , we take those farther back on trust because those near us are so convincingly articulated that the artist's painted "etc." hardly enters our awareness.

These and other tricks show how artists force us to collude with them in their paintings. We are seeing not with our eyes but, as Zeki suggests, with our brain. Over 700 years of Western mimetic representation amassed an impressive array of techniques designed to fool the brain.

And then it all unraveled. Not just painting, but poetry and music as well. Something was going on. What was it?

Downloaded from http://direct.mit.edu/books/book-pdf/2437419/book_9780262356947.pdf by guest on 21 November 2024

9

The Twentieth Century Abandons the Rules: The Age of the Private Format

During the last half of the nineteenth century, artists began pushing hard against the boundaries of their genres. Richard Taruskin illustrates this in his discussion of Gustav Mahler (1860–1911). Taruskin sees the beginning of the modern period as one of "maximization." Like the inflationary universe, everything got bigger very quickly, from the length of operas that exceeded 16 hours (Wagner's *Ring* cycle) to the complexity of harmonic constructions. This is how Taruskin (2005, 26) describes Mahler's pushing the boundaries of tonal music to the very edge but, significantly, not beyond:

> Even within Mahler's output, then, we can observe the pressure to maximalize, to exceed all limits and precedents. Where a "dominant thirteenth" had sufficed as a point of maximum tension in the Second Symphony, the Tenth required a "dominant nineteenth." How much further could this procedure go? In one sense the answer is easy: three more notes can be added to the chord before all the available pitches (or "pitch classes") in the tuning system of Western classical music will have been used up. Then what?

Leonard Bernstein (1967, 54) makes essentially the same point, though less technically:

> All of Mahler's testing, experiments, incursions were made in terms of the past. His breaking-up of rhythms, *his post-Wagnerian stretching of tonality to its very snapping point (but not beyond it!)* [italics mine], his probings into a new thinness of texture, into bare linear motion, into transparent chamber-music-like orchestral manipulation—all these adumbrated what was to become twentieth-century common practice.

Downloaded from http://direct.mit.edu/books/book-pdf/2437419/book_9780262356947.pdf by guest on 21 November 2024

Here is the 19th chord that Taruskin focused on:

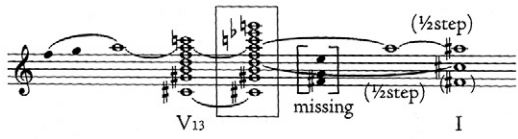


Figure 9.1
Gustav Mahler, Symphony no. 10, Adagio, analytical reduction. From Richard Taruskin, *The Oxford History of Western Music (The Early 20th Century)*, 26, ex. 47–6B.

When Bernstein describes Mahler's Tenth Symphony as the "stretching of tonality to its very snapping point (but not beyond it!)," his remark recalls Shakespeare's line "Never, never, never, never, never," which could aptly be described as the "stretching of metricality to its very snapping point (but not beyond it!)."

While Mahler was pushing against the boundaries of music, Ezra Pound was urging poets to abandon the iambic line (Nadel 1999, 89):

> "Against the metric pattern," he tells the poet Mary Barnard, "struggle toward natural speech. You haven't yet got sense of quantity". … The best "mechanism for breaking up the stiffness and literary idiom is a different meter, the god damn iambic magnetizes certain verbal sequences" … .

And as we saw in chapter 6, he made that advice public in Canto 81 of his still incomplete *Pisan Cantos*, considered to be one of the most important works of the new poetry.[1] Strictly speaking, Pound's remarks are aimed at the granddaddy of all English verse, the iambic pentameter, but as his practice in the *Cantos* shows, his target was all metrical verse.

Pound is echoing what Baudelaire had written in a dedication to his friend Arsène Houssaye in *Le Spleen de Paris*. Pound began writing *The Cantos* in 1915. Baudelaire's dedication, published posthumously in 1869 (2008, 3), reads:

> Who among us has not dreamed, in his ambitious days, of the miracle of a poetic prose, musical without rhythm or rhyme, supple enough and jarring enough to be adapted to the soul's lyrical movements, to the undulations of reverie, to the twists and turns that consciousness takes?

Obviously, weariness with metricality had been brewing for some time. Pound, however, was particularly influential. T. S. Eliot credited Pound more than anyone else with the twentieth century's revolution

Downloaded from http://direct.mit.edu/books/book-pdf/2437419/book_9780262356947.pdf by guest on 21 November 2024

in poetry. Donald Hall echoed the sentiment (1960, 457): "Ezra Pound is the poet who, a thousand times more than any other man, has made modern poetry possible in English." Two decades later, he hadn't changed his mind (1979, 144): "And *this* was the man who had poured the foundations of modern poetry in English." (Not everyone would agree that that was an unqualified good.)

By the first decade of the twentieth century, the back of metrical poetry had been broken. Ezra Pound had been the backbreaker. Tonal music's Ezra Pound was Arnold Schoenberg (1874–1951). He provides a perfect example of how an Easter egg came to replace tonality.

Arnold Schoenberg's Quartet no. 2 was composed between 1907 and 1908. Here is the opening of the fourth part (Taruskin 2005, 316):

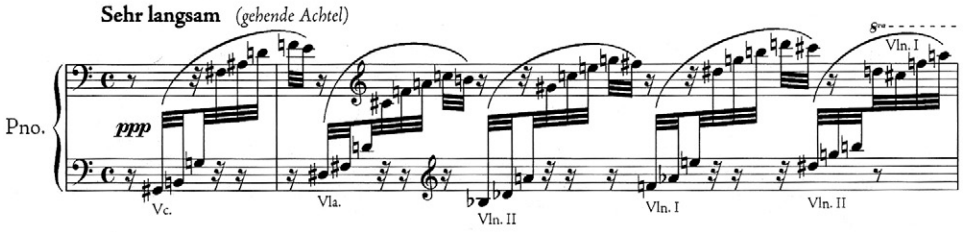



Figure 9.2
Arnold Schoenberg, Quartet no. 2, IV (*Entrückung*), arr. Berg, m. 1. From Richard Taruskin, *The Oxford History of Western Music (The Early 20th Century)*, 316, ex. 52–6.

The five arabesques that begin this part of the quartet are based on a principle that no audience could possibly intuit. The arabesques are generated from what is called the Eschbeg set: a series of notes derived, not from a tonally based key signature, but from a set of notes derived from Schoenberg's name. What could be more private than that? There is no way virgin listeners can be expected to have come to a concert with notes derived from the composer's name already imprinted in their brain the way, for example, face recognition is. Indeed, the gulf between a method of composition and a listener's intuition in parsing that composition could not be more pronounced.

This is how it works. The Eschbeg set is defined by the letters of Schoenberg's name that correspond to the names of the notes in a tonal scale: The German name for E♭ is *Es*. *H* is the German symbol for B and so on. The entire set is: A D E♭ CB B♭ E G.

Downloaded from http://direct.mit.edu/books/book-pdf/2437419/book_9780262356947.pdf by guest on 21 November 2024

```
ArnolD  S  CHönB ErG
|    |  | | |   | | |
A    D  E♭ C B   B♭E G
```

Armed with this set of notes, Schoenberg built each arabesque, varying the instrumental parts systematically (see figure 9.3). As Taruskin says (2005, 316): "[E]ach one of the initial series of arabesques, minus its first and last notes, is a transposition of the Eschbeg set, Schoenberg's musical signature." This kind of compositional principle—manipulation of a series of notes that correspond to the alphabetic letters in one's name—represents a complete break with anything tonal and therefore with anything remotely intuitive. Bach, of course, composed with notes based on his name, as did others, but always within the tonal framework.[2]

By the time we get to Schoenberg's 1911 *Sechs kleine Klavierstücke* ("Six Little Pieces for the Piano"), the door on any sort of public aesthetic has been slammed shut.

Howard Goodall (2013, 302–303) describes Schoenberg and his impact in this unfriendly fashion:

> The "twelve-tone" formula that Schoenberg began exploring in the early 1900s—the one arguably anticipated by Liszt's *Faust* of 1855—treated each of the twelve notes in the Western scale as equals in order to do away with the

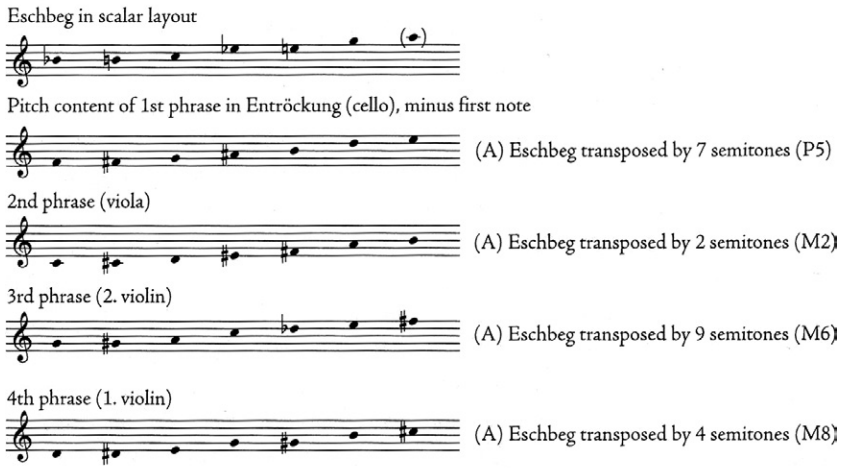

Eschbeg in scalar layout
Pitch content of 1st phrase in Entröckung (cello), minus first note
(A) Eschbeg transposed by 7 semitones (P5)
2nd phrase (viola)
(A) Eschbeg transposed by 2 semitones (M2)
3rd phrase (2. violin)
(A) Eschbeg transposed by 9 semitones (M6)
4th phrase (1. violin)
(A) Eschbeg transposed by 4 semitones (M8)

Figure 9.3
Transposition of the Eschbeg set in Arnold Schoenberg, Quartet no. 2, IV (*Entrückung*). From Richard Taruskin, *The Oxford History of Western Music (The Early 20th Century)*, 316, ex. 52–57.

Downloaded from http://direct.mit.edu/books/book-pdf/2437419/book_9780262356947.pdf by guest on 21 November 2024

> sense of "home" in any given piece of music. Not one of them was allowed to be repeated in a melodic phrase, which prevented the listener's ear from latching on to any note as the centre of gravity. It was as radical a formula for music as it would be for a language if you ruled that no letter of the alphabet could be used more than once in a sentence.[3]
>
> Fascinating and brain-teasing though this limitation might be, its main problem as applied to music was that the only people who understood or admired it were other musicians. The public, then as now, were simply baffled. Schoenberg's theoretical rebellion, which later acquired the labels 'serialism' or 'atonality', produced decades of scholarly hot air, books, debates and seminars, and—in its purest, strictest form—not one piece of music, in a hundred years'-worth of effort, that a normal person could understand or enjoy.

Taruskin (2005, 321) puts it more technically, but arrives at the same conclusion. The musical language of Schoenberg is as private as a secret code:

> No single pitch emerges from the texture with sufficient frequency to suggest itself as a candidate tonic; fifth relations are not salient; major or minor triads are not in evidence, nor are dominant-seventh chords. It would appear that the whole conventional vocabulary of music has been suppressed in favor of *private language* [italics mine].

In his excellent review article of Leonard Bernstein's *The Unanswered Question*, Ray Jackendoff (1977, 886) calls attention to Paul Hindemith's Norton Lectures of 1949–50 (published 1961) in which Hindemith rails against atonality:

> Have we not heard many times of tendencies in modern music to avoid these tonal effects? It seems to me that attempts at avoiding them are as promising as attempts at avoiding the effects of gravitation. … And yet, some composers who have the ambition to eliminate tonality succeed to a certain degree in depriving the listener of the benefits of gravitation. To be sure they do not, contrary to their conviction, eliminate tonality; [but] harmonies both in vertical and horizontal form are arranged so that the tonics to which they refer change too rapidly. Thus we cannot adjust ourselves, cannot satisfy our desire for gravitational orientation. [Brackets are Jackendoff's.]

Appropriately from the point of view of this book, Jackendoff then suggests that "Hindemith's argument is not the layman's reaction of 'I don't like it' or 'The music is too dissonant.' He is arguing rather that atonality goes against human nature, or perhaps even against nature itself, and that this fact explains its difficulty and lack of appeal." In my view, Hindemith seems to be saying something not quite as strong: namely, try as they may, these errant composers are unable to thoroughly banish human nature from their music.

Downloaded from http://direct.mit.edu/books/book-pdf/2437419/book_9780262356947.pdf by guest on 21 November 2024

Another striking example of the Easter egg in an atonal setting is Alban Berg's *Lyric Suite* (1926). The serial structure of the piece is based on the note sequence B F A B♭. In German, those notes are represented by the letters H F A B, the initials of Hanna Fuchs-Robettin and Alban Berg. The suite is a clandestine musical account of their love affair. Both were married at the time it was composed, though not to one another. Numerous other ciphers are embedded in the score, all of which are significant in terms of their "illicit" relationship.

The *Lyric Suite* is a modern example of the Machaut rondeau discussed earlier in that at the time of its premiere it was appreciated as a piece of music by connoisseurs who had no idea of the Easter eggs embedded in it. In fact, it wasn't until a half-century later that musicologists discovered them. The composer David Schiff writes in the *New York Times* (September 21, 2003):

> A few salient facts: The "Lyric Suite" was hailed as a masterpiece on delivery. At the Baden-Baden Festival in 1927, the audience demanded an immediate repeat performance by the Kolisch Quartet. Aaron Copland, who was present, declared the piece "one of the best works written for string quartet in recent years." He praised the "striking clarity of construction" and found the work "comparatively easy to comprehend."
>
> In other words, the meaning of the "Lyric Suite" was clear before abstruse serial analysis and before people outside Berg's circle learned of his liaison with Fuchs-Robettin.

Schoenberg's Quartet no. 2 was written in 1908. Seven years later, Marcel Duchamp began his masterpiece *The Bride Stripped Bare by Her Bachelors, Even (The Large Glass)* (figure 9.4). In French, the title is *La mariée mise à nu par ses célibataires, même*. Duchamp created an accompanying set of notes (*The Green Box*) in order to prevent a purely visual response to the work. Given that, it is worth noting that the upper frame is devoted to *La mariée* and the bottom frame to *ses célibataires*. Now consider that the first three letters of *mariée* and the first three letters of *célibataires* taken together spell out *Marcel*. Schoenberg and Berg were not alone in centering a work of art around one's name as Easter egg.

Not all Easter eggs involve the artist's name. Consider this poem by Wallace Stevens:[4]

Theory

I am what is around me.
Women understand this.

Downloaded from http://direct.mit.edu/books/book-pdf/2437419/book_9780262356947.pdf by guest on 21 November 2024

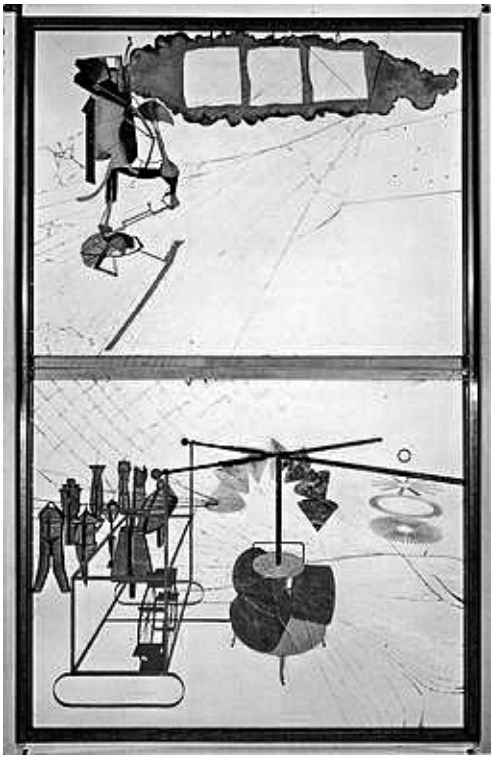


Figure 9.4
Marcel Duchamp, *The Bride Stripped Bare by Her Bachelors, Even (The Large Glass)*, 1915–1923

One is not duchess
A hundred yards from a carriage.
These, then are portraits:
A black vestibule;
A high bed sheltered by curtains.
These are merely instances.

It is clear by inspection that the poem is not metrical. Indeed, the only "metrical" unit is line length. It is also clear that the poem does not make much sense on first reading. Why, for example, should a woman understand the mysterious opening line *I am what is around me* and not, say, a man? A typical exegesis would undoubtedly reach for some notion of women being more socially aware than men, having a higher emotional intelligence, that sort of thing. But that wouldn't help much when we

Downloaded from http://direct.mit.edu/books/book-pdf/2437419/book_9780262356947.pdf by guest on 21 November 2024

come to the portraits. Why is a black vestibule or a high bed sheltered by curtains "then" a portrait? And what does that have to do with women understanding the import of the first line?

A reader first coming to Stevens would doubtless and understandably scratch his or her head. The poem is a prime example of why Stevens is considered a difficult poet. And, indeed, there is good reason to think that. The reason is that to understand this poem we need to enlist something like Schoenberg's Eschbeg set.

Consider the second line in the context of the first line but from a purely orthographic point of view. The second line begins with the word *women*. Notice that *women* contains the word *me*. Taking the first line literally, what is around *me* in the orthographic word *women* is the sequence *won*. Now notice that its homonym, *one*, is the first word of the next line. And the first word of the next line, *a*, is the reduced form of *one*.

Now come two portraits, *a black vestibule* and *a high bed sheltered by curtains*. Why are these portraits? The reason is that they are visual counterparts of the orthographic word *women*. Each portrait is of a vehicle that can contain someone inside just as *women* contains *me*. Here the private format is the orthographic play on the word *women* treated both as a source of the idea "I am what is around me" and as an orthographic counterpart of a portrait.

The objects that Stevens presents as portraits—a bed, a vestibule, and a carriage—are frames around (some)one just as *wo-n* is a frame around *me*. There is no way this can be seen as the result of a privileged category of the brain. Rather, it is a playfully ingenious idea whose source is general intelligence. It is up for grabs whether the reader gets it or not. The brain is going to offer precious little by way of "sorting out" help. Clearly, understanding this kind of poem is a different ballgame from understanding "To His Coy Mistress" or "How Many Bards Gild the Lapses of Time."

As striking as "Theory" is as an example of the private Easter egg in post-twentieth-century poetry, there is an even more remarkable example. It is the twentieth century's poetic counterpart of Machaut's "Ma fin est mon commencement."

Up to now I have talked about private formats as if they were Holy Grails that one has to discover in order to unlock the work of art in which they are hidden. It isn't always the case that the game is worth

Downloaded from http://direct.mit.edu/books/book-pdf/2437419/book_9780262356947.pdf by guest on 21 November 2024

the candle. It's hard to see how discovering the Eschbeg set enhances our appreciation of Schoenberg's Quartet no. 2 any more than coming across the "Gray Dot" enhances a game of *Adventure*.

On the other hand, examples like "Theory" demonstrate that finding the Easter egg is critical to understanding the work.[5] It does not follow, however, that a private format must a fortiori be outside the realm of hardwired predilections of the brain. There is, in fact, one example I know in which the private format of the poem taps into a critical property of the brain's ability to produce and process language, namely, recursiveness. The poem I have in mind is Wallace Stevens's "The Snow Man."[6]

The Snow Man

One must have a mind of winter
To regard the frost and the boughs
Of the pine-trees crusted with snow;

And have been cold a long time
To behold the junipers shagged with ice,
The spruces rough in the distant glitter

Of the January sun; and not to think
Of any misery in the sound of the wind,
In the sound of a few leaves,

Which is the sound of the land
Full of the same wind
That is blowing in the same bare place

For the listener, who listens in the snow,
And, nothing himself, beholds
Nothing that is not there and the nothing that is.

This poem contains an Easter egg every bit as complicated and as inaccessible as Machaut's retrograde structure. To understand this, we need to digress for a moment into certain complexities of English grammar. I hope you will find the digression worth it.

We have seen that Fred Lerdahl and Ray Jackendoff (1983) take the position that in order to understand a piece of music it is necessary to bring to the listening experience a set of rules designed to reveal the structure of the piece. Understanding a sentence involves the same sort of thing. One cannot just attend to the words. One must also attend at some level of consciousness to the structures our knowledge of language superimposes on those words. You can no more help doing this than you can

Downloaded from http://direct.mit.edu/books/book-pdf/2437419/book_9780262356947.pdf by guest on 21 November 2024

keep from breathing, even though, as with breathing, you are not aware that you are doing it.

This fact can be used to trip you up. Psycholinguists who like to do these sorts of things have made up so-called *garden path* sentences designed to fool you. The trick depends on two assumptions. The first is that as we process incoming strings of words, we unconsciously assign structure to those words. The second is that in assigning structure, we want to come to closure as quickly as possible. Here is an example:

The horse raced past the barn fell.

Most people will have to reread this sentence several times before they realize that the subject of the sentence, *the horse*, takes as its main verb, not what at first sight appears to be the nearest verb, *raced*, but the farthest verb, *fell*.[7] To make the sentence more understandable, we can add the word *that* to show that the phrase *raced past the barn* is actually a relative clause modifying *the horse*:

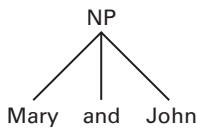
[The horse [that raced past the barn]] fell.

What trips us up is the unconscious attention we pay to the structure. We want to assign structure as quickly as possible. Consequently, we assume that the sentence has come to an end after the word *barn*:

The horse raced past the barn.

We are utterly confused when another verb, *fell*, follows immediately. This concept is a central key to "The Snow Man." In order to see this, we will need to think a bit about the structure of the poem.

The poem is carved out of the syntax of conjunction. Let's look at the properties of conjunction. In English, two similar grammatical elements may be joined together by a conjunction such as *and*, *or*, *nor*, *neither*, or *either*. These work in an intricate way. Two elements can be conjoined only if they belong to the same linguistic category. Proper names are a good example to start with—say, a conjoined noun phrase (NP) *Mary and John*, which we represent like this:

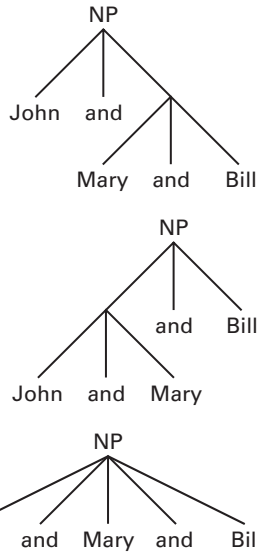


Downloaded from http://direct.mit.edu/books/book-pdf/2437419/book_9780262356947.pdf by guest on 21 November 2024

What happens when we add just one more name to the list of conjoined elements?

John and Mary and Bill

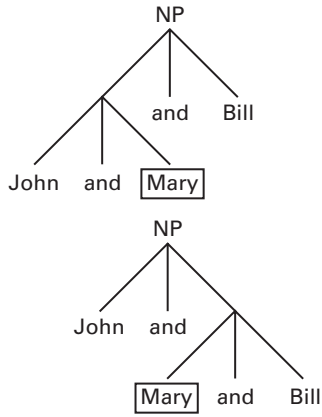
Now the sequence is ambiguous. The proper names can be lumped together in any of these fashions:



That conjunctions are ambiguous is a fact of English grammar. It doesn't much bother us in conversation since it is generally clear from the context what particular packages are meant. We take the ambiguity of conjunction for granted. I wouldn't be surprised if most readers of this book are discovering for the first time that this kind of ambiguity actually exists. And there is no reason why they should have been aware of it. It is the kind of thing that lawyers (and poets) may worry about, not speakers of ordinary speech.[8]

What about Wallace Stevens, the poet? He not only noticed this property but used it to create "The Snow Man." Before we look at the poem itself, let's go back a moment to two of the above-mentioned conjoined structures:

Downloaded from http://direct.mit.edu/books/book-pdf/2437419/book_9780262356947.pdf by guest on 21 November 2024



The noun phrase *Mary* has been placed in a box because it occupies a pivotal position in the sequence *John and Mary and Bill*: it can be either the second element of the first conjunct or the first element of the second conjunct.

Although the conjunction system of English produces ambiguous sentences galore, it also offers occasional relief in the form of signposts. Conjoined structures that are identical are allowed to eliminate some of the conjoined words, provided they occur later in the sequence. Instead of having to say this:

Frank went home with John and with Mary.

you can forget about the second occurrence of *with*:

Frank went home with John and Mary.

Where does the relief come in? Suppose you say:

Frank went home with John and Mary and with Bill.

There is no doubt that *John and Mary* are a package separate from *Bill*. Judicious use of *with* allows us to signal the packaging. But the ambiguity would creep right back in again if the second occurrence of *with* were eliminated:

Frank went home with John and Mary and Bill.

Armed with these niceties of conjunction, we are now ready to tackle "The Snow Man." Even though it consists of 15 lines, it is syntactically a single sentence! This has not gone unnoticed, though critics have never

Downloaded from http://direct.mit.edu/books/book-pdf/2437419/book_9780262356947.pdf by guest on 21 November 2024

made as much of this fact as I am about to do, perhaps because they weren't aware that attending to words means attending to structure.

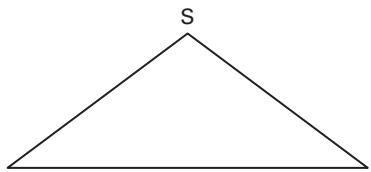
Let's begin at the beginning:

> One must have a mind of winter
> To regard the frost and the boughs
> Of the pine-trees crusted with snow;

Here is our first conjoined structure:

> To regard the frost and the boughs
> Of the pine-trees crusted with snow;

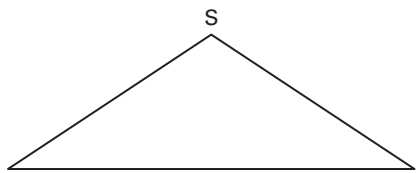
The infinitive *to regard* has a compound object: *the frost and the boughs of the pine-trees crusted with snow*. But when we come to the end of the clause, we also come to the conclusion that we are at the end of a complete sentence:[9]



One must have a mind of winter
To regard the frost and the boughs
Of the pine-trees crusted with snow;

This is the "garden path" strategy at work: assume that you have come to the end of a sentence as soon as you can.

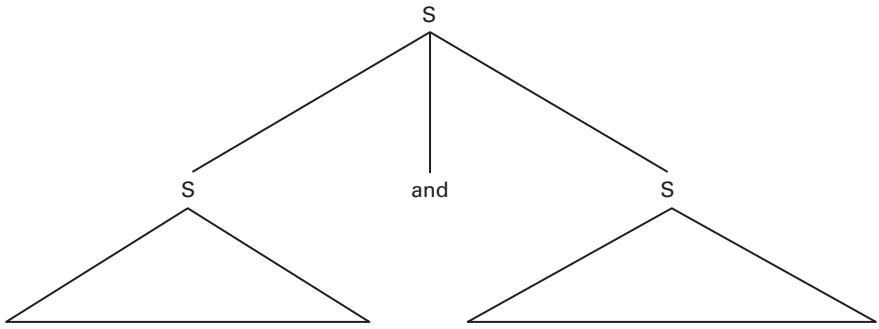
Notice how the poem continues:



And have been cold a long time
To behold the junipers shagged with ice,
The spruces rough in the distant glitter
Of the January sun;

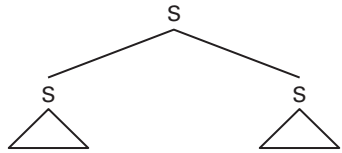
We see the conjunction *and* and we are aware of the gap that follows it. *One must* has been left out. We have just seen that leaving things out can be a hint that we are approaching the second element of a conjoined structure. In fact, everything about conjunction is conspiring to make us think we have reached the second half of a compound sentence:

Downloaded from http://direct.mit.edu/books/book-pdf/2437419/book_9780262356947.pdf by guest on 21 November 2024


S
S
and
S
One must have a mind of winter
To regard the frost and the boughs
Of the pine-trees crusted with snow;
(one must) Have been cold a long time
To behold the junipers shagged with ice,
The spruces rough in the distant glitter
Of the January sun;

Remember that a crucial property of a conjoined structure is that both conjuncts must be alike. Stevens has gone to great lengths to impose that structure on this poem. The first conjunct has an infinitival verb, *regard*, which has a compound object, *frost* and *boughs*. The second conjunct has an infinitival verb, *behold*, which also has a compound object, *junipers* and *spruces*, although in the second conjunct the *and* has been suppressed.

At the end of the first clause we concluded, naturally enough, that we had come to the end of a sentence. But when we read on, we found that we were not at the end of a sentence at all. Rather, we were at the end of the first conjunct of a conjoined sentence. At the second semicolon, we conclude, naturally enough, that the structure Stevens has created for us is a straightforward compound sentence, a structure looking something like this:



Once again, the "garden path" stratagem forces us to assume the end of a sentence. However, no sooner have we settled on a compound sentence than we are confronted with another *and*. We are forced to reanalyze yet again. The next important clause for analysis is:

And not to think
Of any misery in the sound of the wind,
In the sound of a few leaves,

Downloaded from http://direct.mit.edu/books/book-pdf/2437419/book_9780262356947.pdf by guest on 21 November 2024

Which is the sound of the land
Full of the same wind
That is blowing in the same bare place

For the listener. …

What is the appropriate analysis? We have already seen that when we encounter a conjunction, it is important to look for the conjoined elements. The problem is that we have already come to the conclusion that we have exited a conjoined structure only to find that, far from having exited one, we are still in one. The poem is a bit like a set of Russian nesting dolls.

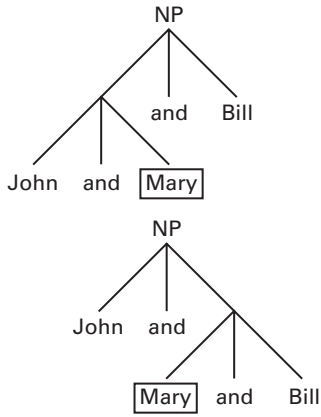
Stevens has so constructed the poem that the reader is now forced once again to reanalyze everything that has been analyzed up to now. Stevens is constructing a complicated garden path for us and he is leading us down it.

The problem now is this: if the *and* of *and not to think* is about to introduce the second of two conjuncts, then what is the first conjunct? The startling answer is that it is the clause that we have mistakenly taken to be the second conjunct of a conjoined sentence, namely:

And have been cold a long time
To behold the junipers shagged with ice,
The spruces rough in the distant glitter
Of the January sun;

The appropriate structure is shown in figure 9.5.

Recall our earlier discussion of the pivotal role that the boxed noun can play in a conjoined structure like this one:



Downloaded from http://direct.mit.edu/books/book-pdf/2437419/book_9780262356947.pdf by guest on 21 November 2024

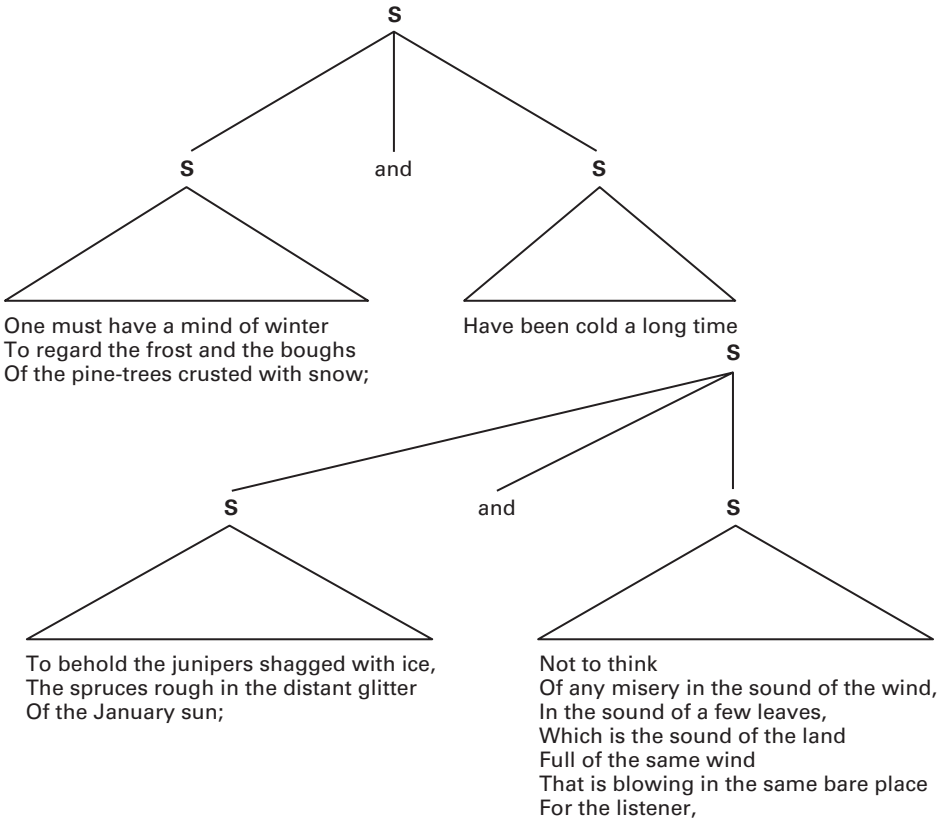

S
S
and
S
One must have a mind of winter
To regard the frost and the boughs
Of the pine-trees crusted with snow;
Have been cold a long time
S
S
and
S
To behold the junipers shagged with ice,
The spruces rough in the distant glitter
Of the January sun;
Not to think
Of any misery in the sound of the wind,
In the sound of a few leaves,
Which is the sound of the land
Full of the same wind
That is blowing in the same bare place
For the listener,

Figure 9.5

It can be either the first or the second element of a conjunction package, depending on whether we look ahead or look back. In "The Snow Man," Stevens has constructed just such a boxed element. It is a clause that at one point in the poem looks like a perfect parallel to the clause that has gone before but that, at a later point, is the perfect parallel to what follows. It is the clause boxed in figure 9.6.

Take a close look at the boxed clause. *Behold* has a compound object, *junipers shagged with ice* and *spruces rough in the distant glitter of the January sun*. They are conjoined by an understood *and* (in brackets). The parallel with the preceding clause is obvious. There, *regard* has a compound object as well, *the frost and the boughs of the pine-trees crusted*

Downloaded from http://direct.mit.edu/books/book-pdf/2437419/book_9780262356947.pdf by guest on 21 November 2024

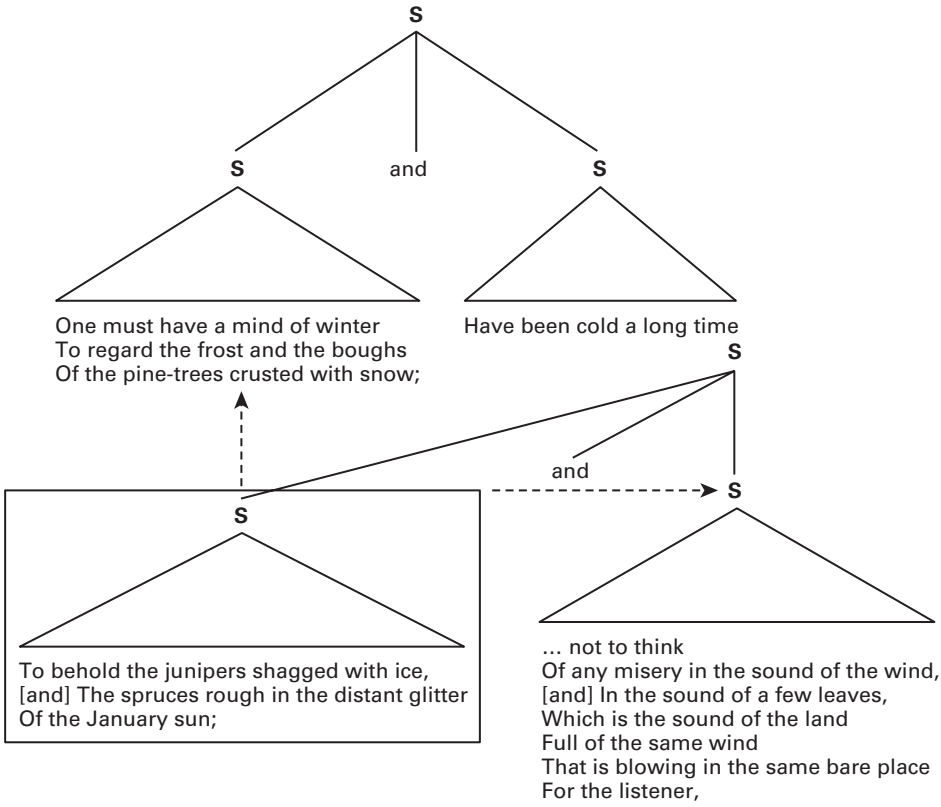

S
S
and
S
One must have a mind of winter
To regard the frost and the boughs
Of the pine-trees crusted with snow;
Have been cold a long time
S
and
S
S
To behold the junipers shagged with ice,
[and] The spruces rough in the distant glitter
Of the January sun;
... not to think
Of any misery in the sound of the wind,
[and] In the sound of a few leaves,
Which is the sound of the land
Full of the same wind
That is blowing in the same bare place
For the listener,

Figure 9.6

with snow. But the boxed clause also has the same structure as the clause following it. *Not to think of any misery* has two parallel prepositional phrases, *in the sound of the wind* and *in the sound of a few leaves*, again with an understood *and* (in brackets).

In other words, in keeping with the principle that we like to close all structures as soon as possible, as soon as we come to the end of the boxed clause, we take it to be the final element in a conjoined structure. But then we encounter the next *and*. We are forced to rethink our analysis. Now the boxed clause is the first element of a conjoined structure.

Strictly speaking, we now have a structure that is ambiguous in just the way that *John and Mary and Bill* can be analyzed either as [[*John and*

Downloaded from http://direct.mit.edu/books/book-pdf/2437419/book_9780262356947.pdf by guest on 21 November 2024

Mary] *and Bill*] or as [*John and* [*Mary and Bill*]].[10] We seem to be stuck with this ambiguity. Or are we?

There is a further fact relevant to Stevens's design. Appositive relative clauses are another form of conjunction:

John lives next door and he is from Philadelphia.
John—and he is from Philadelphia—lives next door.
John, who is from Philadelphia, lives next door.

Here English punctuation plays an important role. Appositive relative clauses are traditionally separated from the noun they modify by a comma:

The Japanese, who are industrious, are very happy.
The Japanese who are industrious are very happy.

The first says that all Japanese people are industrious; the second doesn't. The close relationship between appositive relative clauses and conjunction is pointed up by the fact that the sentence:

The Japanese, and they are industrious, are very happy.

is for all intents and purposes synonymous with:

The Japanese, who are industrious, are very happy.

and not with:

The Japanese who are industrious are very happy.

So, if appositive relatives are simply another form of conjunction, then where is Stevens taking us? The closing stanza of "The Snow Man" provides the answer:

… , who listens in the snow,
And, nothing himself, beholds
Nothing that is not there and the nothing that is.[11]

This stanza is, in fact, an appositive relative clause. Strikingly, it contains two overt occurrences of the conjunction *and*. The first conjoins a compound verb phrase consisting of two verb phrases, beginning with *listens* and *beholds*. The second conjoins the compound object of *beholds*, consisting of two noun phrases, *nothing that is not there* and *the nothing that is*.

The structure is shown in figure 9.7.

Downloaded from http://direct.mit.edu/books/book-pdf/2437419/book_9780262356947.pdf by guest on 21 November 2024

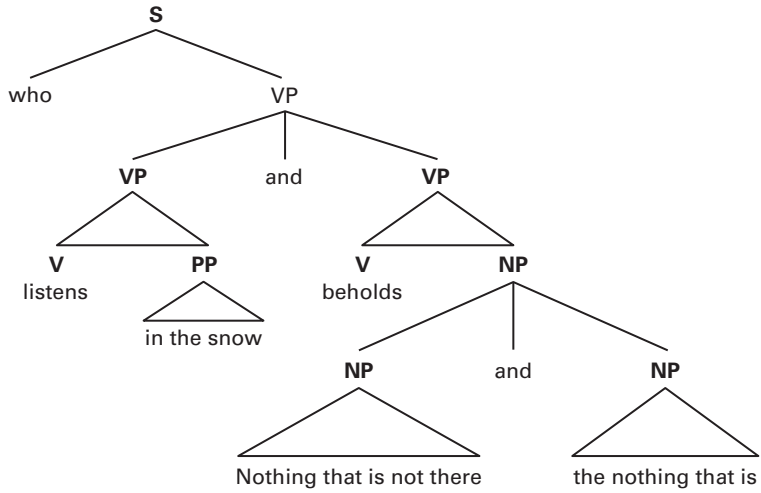


Figure 9.7

What is the relationship of this structure to everything that has gone before? If *who* is a variant of *and he*, then, when we come to the final clause of "The Snow Man," we are confronted with yet one more conjunction:

> For the listener, [and he] listens in the snow
> And, nothing himself, beholds
> Nothing that is not there and the nothing that is.

Up to now, each conjunct that we have encountered has been a reflection of its preceding partner. This is as it should be, since conjuncts are identical structures held together by *and*. We saw further that Stevens used the accidental ambiguity of the conjunctional system to lead us down several garden paths. First, he had us believe that we were safely within some structure only to reveal by what followed that we were not. Now, at the end of the poem, we find yet one more conjunction in the form of the appositive relative pronoun *who* and we have to ask: if this is the final conjunct, then what is it conjoined with? The answer is that it is conjoined with the entire poem that has gone before.

To see this, let us first look at the structure of the final stanza, substituting *and he* for *who* as the conjunction; see figure 9.8.

Downloaded from http://direct.mit.edu/books/book-pdf/2437419/book_9780262356947.pdf by guest on 21 November 2024

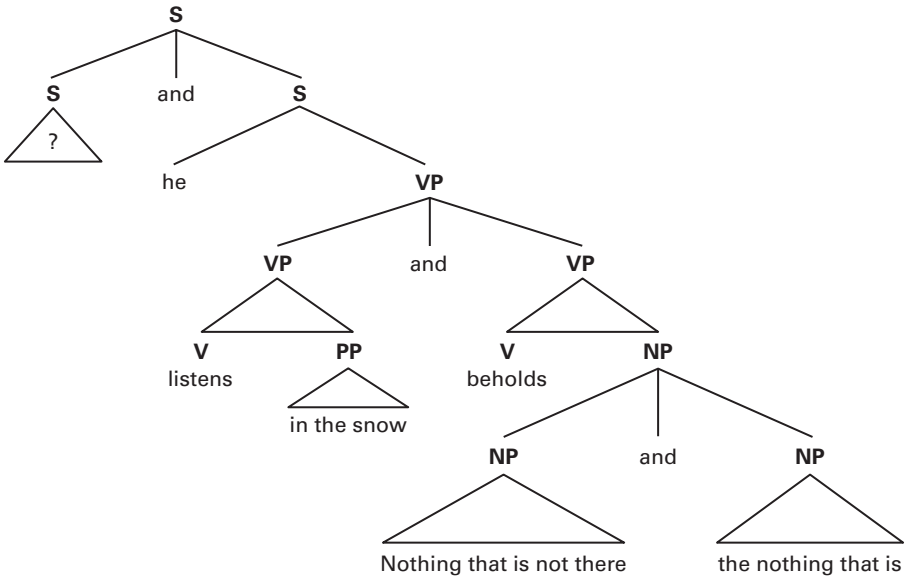


Figure 9.8

If the structure under the right-hand S is correct, then it ought to be the case that the structure under the left-hand S (represented by the question mark inside the triangle) is identical to it. Remember that that structure is no less than the structure of the entire poem up to the sequence that ends with the prepositional phrase *for the listener*. To see what that structure looks like, see figure 9.9.

Now, if you were to trace figures 9.9 and 9.10 on separate sheets of paper, superimpose one on top of the other, and hold them up to the light, you would see that the structures are identical.

This is just what one would expect if they were related by conjunction. The ambiguity is immediately resolved. The overall syntactic structure of the poem, then, constitutes the grammatical counterpart of a Calder mobile with all the complexity of a Machaut retrograde; see figure 9.11.

Downloaded from http://direct.mit.edu/books/book-pdf/2437419/book_9780262356947.pdf by guest on 21 November 2024

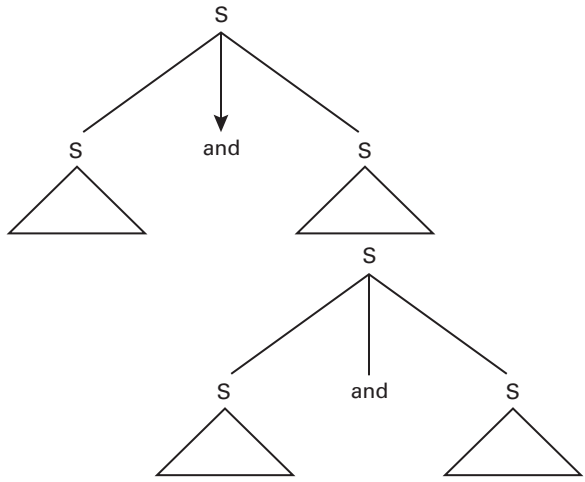


Figure 9.9

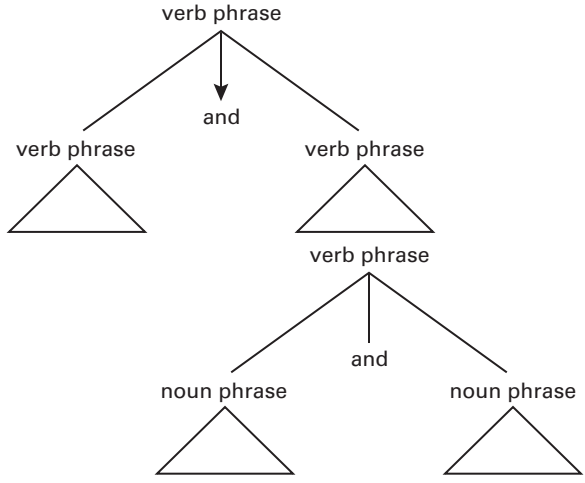


Figure 9.10

Downloaded from http://direct.mit.edu/books/book-pdf/2437419/book_9780262356947.pdf by guest on 21 November 2024

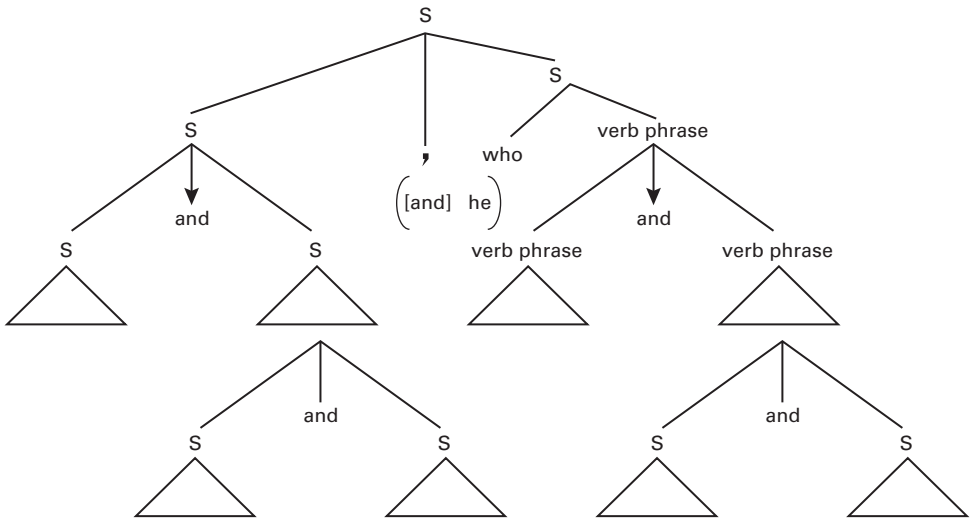


Figure 9.11

The single sentencehood of "The Snow Man" is not some accidental or subordinate property of this poem. This seems like a good spot to recall Stevens's gentle response to Miss Wirtz:

> Dear Miss Wirtz:
> … If the meaning of a poem is its essential characteristic, people would be putting themselves to a lot of trouble about nothing to set the meaning in a poetic form.
>
> Very truly yours,
> Wallace Stevens

But meaning must count for something, dammit, to paraphrase Geoffrey Stokes (see chapter 5). Let's consider the meaning of "The Snow Man" in the context of its structure. The poem is about seeing reality free from the encumbrances that human beings bring to seeing. Frank Kermode (1960, 34) comments as follows:

> Out of "The Snow Man" grows the recurring metaphor of winter as a pure abstracted reality, a bare icy outline purged clean of all the accretions brought by the human mind to make it possible for us to conceive of reality and live our lives. So purged, reality has no human meaning, nor has a man: he is
>
> … the listener, who listens in the snow,
> And, nothing himself, beholds
> Nothing that is not there and the nothing that is.
>
> In winter, things are seen as they are.

Downloaded from http://direct.mit.edu/books/book-pdf/2437419/book_9780262356947.pdf by guest on 21 November 2024

In his April 18, 1944, letter to Hi Simons, Stevens himself says of "The Snow Man":

> I shall explain the Snow Man as an example of the necessity of identifying oneself with reality in order to understand it and enjoy it.
>
> What is essentially at the heart of the poem is the need to abstract away from our humanity in order to perceive reality.

Taking these perspectives into account, the syntactic process demanded by "The Snow Man" can be seen as a metaphor for the poem's content: namely, the process the poet says we must go through to see things as they are. The syntax forces the reader to constantly reanalyze in order to arrive at the ultimate structure of the poem, just as the poem declares that one must constantly shed one's human perceptions of the world until, in winter, one can see "Nothing that is not there and the nothing that is."[12]

There is a fortuitous convergence with Stevens's point of view in this poem and what we've been saying about the seventeenth century. Just as Newton forced the Galilean notion of an intelligible world to be set aside in favor of intelligible theories, so too does "The Snow Man" suggest setting aside an intelligible world—winter is miserable—for an intelligible theory—the world as a Snow Man might see it.[13]

Sometime in the early 1970s, I was invited to give a lecture on Wallace Stevens at a university in Paris. I thought I would make a mobile of "The Snow Man" as a visual aid. I used wire coat hangers, string, and (for the words) squares of white cardboard. It balanced perfectly. If you gave it a slight tap, the poem swung around itself like a three-dimensional version of a cubist painting. It all seemed so perfect for a Paris lecture. Unfortunately, my sponsor neglected to tell me that my lecture coincided with a student strike. A left-wing group, part of an extreme political movement known as the *gauchistes*, were understandably upset at the thought of a lecture going on during their strike. They burst into the room and marched in a circle around the audience while the leader rang a handbell in my face like a town crier beneath a street lamp. The noise drowned out my talk. Then the leader snatched the mobile of "The Snow Man" and threw it out the window along with my briefcase. We were on the fourth floor. Somehow, it all seemed fitting. I felt like a participant in a Dada performance.[14]

"The Snow Man" is a tour de force. To the best of my knowledge, no other poem in English so weds syntactic form to content. And yet this property has remained hidden from critics of Stevens's work.[15] I don't

Downloaded from http://direct.mit.edu/books/book-pdf/2437419/book_9780262356947.pdf by guest on 21 November 2024

think that is because critics are more obtuse than anyone else. Rather, I think this property of "The Snow Man" is like Chaucer's translation of Oton de Granson. The design is there but it is well-hidden, like an Easter egg, and Stevens doesn't much care whether the reader gets it any more than Machaut cared whether the listener discerned the retrograde character of "Ma fin est mon commencement."

But what Stevens, Chaucer, and Machaut all have in common is that their constructions reinforce the content of the associated poetry. Those constructions are the Easter eggs.

I began by suggesting that Stevens exploited the structural properties of English to construct his poem. Conjunction involves an ambiguity that arises when there are more than two conjuncts in a conjoined structure. This ambiguity is a by-product of the way conjunction operates in English. It has no grammatical or linguistic use. In fact, one can easily see that from a communication point of view it is counterproductive. However, it is superbly suited as an occasion for a design, and Stevens is, to the best of my knowledge, the only poet who has exploited it to such advantage. And, just to be sure we keep this in mind, the property he has exploited is the recursiveness of English conjunction.[16]

I hope that the preceding account will give you some idea of what Wallace Stevens meant when he wrote, "If the meaning of a poem is its essential characteristic, people would be putting themselves to a lot of trouble about nothing to set the meaning in a poetic form."[17] The device of "The Snow Man"—this artifice if you will—is about as private as one can get. There is no way at all that Stevens could hope his audience would latch onto it. It is no wonder he had given up explaining his poems long ago.

With respect to Stevens and Chaucer, we have seen that if we dig a bit, we can hit pay dirt in understanding a poem. But what to do with something like this poem by John Ashbery?

These Lacustrine Cities

These lacustrine cities grew out of loathing
Into something forgetful, although angry with history.
They are the product of an idea: that man is horrible, for instance,
Though this is only one example.

They emerged until a tower
Controlled the sky, and with artifice dipped back
Into the past for swans and tapering branches,
Burning, until all that hate was transformed into useless love.

Downloaded from http://direct.mit.edu/books/book-pdf/2437419/book_9780262356947.pdf by guest on 21 November 2024

Then you are left with an idea of yourself
And the feeling of ascending emptiness of the afternoon
Which must be charged to the embarrassment of others
Who fly by you like beacons.

The night is a sentinel.
Much of your time has been occupied by creative games
Until now, but we have all-inclusive plans for you.
We had thought, for instance, of sending you to the middle of the desert,

To a violent sea, or of having the closeness of the others be air
To you, pressing you back into a startled dream
As sea-breezes greet a child's face.
But the past is already here, and you are nursing some private project.

The worst is not over, yet I know
You will be happy here. Because of the logic
Of your situation, which is something no climate can outsmart.
Tender and insouciant by turns, you see

You have built a mountain of something,
Thoughtfully pouring all your energy into this single monument,
Whose wind is desire starching a petal,
Whose disappointment broke into a rainbow of tears.

In her detailed discussion of this poem, Marjorie Perloff (1993, 10–11) describes her encounter with it in a way that is reminiscent of Billy Collins's admonition against tying a poem to a chair and beating the meaning out of it with a hose:

> Suppose, for example, that we take the "lacustrine cities" of the first stanza to represent some sort of defense mechanism, erected by the poet to protect himself from the fluidity of his subconscious, from the terrible awareness "that man is horrible, for instance." In this context, the emergent "tower" of stanza 2 makes sense, but when Ashbery tells us that this tower "dipped back / Into the past for swans and tapering branches," the narrative becomes enigmatic. Why is the poet's carefully conceived "tower" arising from lacustrine depths "burning"? And who is the "you" that suddenly appears in stanza 3, or the "we" who want to relegate this "you" to "the middle of the desert" or "to a violent sea"? How does the "I" of stanza 6 know that "You will be happy here"? Is he talking to himself or to someone else? In this context, the phrase "Because of the logic / Of your situation, which is something no climate can outsmart," is particularly ironic because the "situation" has no "logic" whatever. Indeed, the poem blocks all attempts to rationalize its imagery, to make it conform to a coherent pattern. … Reading Ashbery's text is thus rather like overhearing a conversation in which one catches an occasional word or phrase but cannot make out what the speakers are talking about.

Downloaded from http://direct.mit.edu/books/book-pdf/2437419/book_9780262356947.pdf by guest on 21 November 2024

> And yet one does keep listening. For the special pleasure of reading a poem like "These Lacustrine Cities" is that disclosure of some special meaning seems perpetually imminent.

Perloff calls this the poetry of "indeterminacy."[18] This is a kind of carrot-and-stick theory. The stick is the poem. The carrot is the promise of a "disclosure"—in my terms, a private format.

Later (p. 18), Perloff says:

> For what happens in Pound's *Cantos,* as in Stein's *Tender Buttons* or Williams' *Spring and All* or Beckett's *How It Is* or John Cage's *Silence*, is that the symbolic evocations generated by words on the page are no longer grounded in a coherent discourse, so that it becomes impossible to decide which of these associations are relevant and which are not. This is the "undecidability" of the text I spoke of earlier.

Consequently, she finally (p. 262) describes an Ashbery poem in these terms:

> *Language always on the point of revealing its secret*—this pattern of opening and closing, of revelation and re-veiling, of simultaneous disclosure and concealment is the structural principle of the Ashbery poem.

I suppose the pleasure in this kind of post-natural-aesthetic poetry comes not just in the expectancy of disclosure but also in trying to conjure up a narrative to connect the images.[19] That, in fact, seems to be what most critics of this kind of poetry invest their time in when they say things like this (repeating Perloff's words above):

> Suppose, for example, that we take the "lacustrine cities" of the first stanza to represent some sort of defense mechanism, erected by the poet to protect himself from the fluidity of his subconscious, from the terrible awareness "that man is horrible, for instance."

Well, maybe that's what Ashbery had in mind. But maybe not. And how would we ever know? Obviously, the genre works for a specialized audience. It embodies one answer to the question: What kind of poetry do you write when you've jettisoned the natural aesthetic? For at least one kind, the Ashbery kind, its heart's blood seems to be the conjuring of a string of images that creates a kind of semantic collage and challenges the reader to make sense of it. I use the word *collage* deliberately. Ashbery made scores of them from the time he was a student at Harvard until he died. Parallels between an Ashbery collage and an Ashbery poem are obvious. The poet provides the images and the reader/viewer provides the narrative, like adding eggs to a cake mix.

Downloaded from http://direct.mit.edu/books/book-pdf/2437419/book_9780262356947.pdf by guest on 21 November 2024

But even this is sometimes impossible. In speaking of Ashbery's "Europe," Perloff (1993, 267–268) notes that with respect to reconstructing a narrative, "disclosure is so totally blocked that the reader is all but excluded from the world of the text." Here are the first five sections of "Europe" from *The Tennis Court Oath*, about which Perloff seems exactly right:

1.
To employ her
construction ball
Morning fed on the
light blue wood
of the mouth
cannot understand
(Feels deeply)

2.
A wave of nausea—
numerals

3.
a few berries

4.
the unseen claw
Babe asked today
The background of poles roped over
into star jolted them

5.
filthy or into backward drenched flung heaviness
lemons asleep pattern crying

This is Tristan Tzara's private poetry in spades.[20] There is no way in, though one can imagine readers trying to attach a narrative to (slightly) less opaque poems like "These Lacustrine Cities." As Perloff implies,[21] the pleasure would be in using one's general intelligence to try to find an Easter egg/narrative because, lord knows, the reader is not going to get any help from the natural aesthetic. Here, modernist poetry like Ashbery's and modernist painting join hands. Both frequently are in need of explication.[22]

The doctrine of artistic indeterminacy is not new. What is new is its application to poetry. In the early nineteenth century, it was called upon to explain musical pleasure when Thomas Twining (1735–1804)

Downloaded from http://direct.mit.edu/books/book-pdf/2437419/book_9780262356947.pdf by guest on 21 November 2024

commented on Aristotle's *Poetics*, in an essay in which he said (1812, 74) that music

> is not *imitative*, but if I may hazard the expression, merely *suggestive*. But, whatever we may call it, this I will venture to say,—that in the *best* instrumental Music, expressively *performed*, the very indecision itself of the expression, leaving the hearer to the free operation of his *emotion* upon his *fancy*, and, as it were, to the free *choice* of such ideas as are, *to him*, most adapted to react upon and heighten the emotion which occasioned them, produces a pleasure, which nobody, I believe, who is able to feel it, will deny to be one of the most delicious that Music is capable of affording.[23]

Twining's statement is highly reminiscent of Perloff's conclusion: "For the special pleasure of reading a poem like 'These Lacustrine Cities' is that disclosure of some special meaning seems perpetually imminent."

Could it be that lack of specificity in music and in poetry is one source of their pleasurableness? This parallel between music and inaccessible poetry is certainly worth exploring.[24] Nor is painting out of the picture. One can think of theories about schools of painting as attempts to supply narratives because, just like opaque poetry and music, painting benefits from a story. Let me illustrate with a personal anecdote.

In the summer of 2011, my wife, our friend Duane Paluska, and I visited an Edward Hopper exhibit at Bowdoin College in Brunswick, Maine. Duane, an artist, ran a local gallery. The exhibit focused on Hopper's early, bucolic paintings, those he executed before he turned away from that subject matter circa 1927. I didn't know these paintings. I was struck by how unoriginal they were. They were little more than Charles Woodbury knockoffs, Woodbury being the painter who established the so-called Ogunquit outpost for Boston impressionists. Hopper's work was all pretty much of a muchness with theirs.

The exhibit surprised me because I am a great admirer of Hopper. I mentioned my disappointment to Duane. He replied, "If Hopper hadn't put people in his paintings, no one would have ever heard of him."

The remark struck home. The Hopper paintings I remember all have people in them and names like *Automat*, *Blue Night*, *Chop Suey*, *11 AM*, *Girlie Show*, *Hotel Room*, and *Nighthawks*. I'm not saying that the storefronts, the sailboats, the lighthouses, the row houses, and so forth aren't memorable. But it is the ones with people and their narratives that I would leave in the lifeboat.

Downloaded from http://direct.mit.edu/books/book-pdf/2437419/book_9780262356947.pdf by guest on 21 November 2024

My friend's comment goes well beyond Hopper. If one recalls that the great majority of paintings prior to modernism had people in them, people easily identified with a particular narrative, whether religious (all those madonnas and crucifixions), or military (from the *Battle of San Romano* to *Friedland* or *The Campaign of France*), or familial (the *Arnolfini Portrait* and *Las Meninas*), then it is a remarkable fact that one of the hallmarks of modernism is the disappearance of narrative in imagery and in poetry. This unites Ashbery and Duchamp et al. Of course, not all poets and painters gave up narrative. But in terms of the present discussion, this was an important part of the departure from the past.[25]

Narrative structure is a conservative force. It was under attack as early as the 1920s by the Dadaists, who practiced a form of poetry called "cut up." The idea was to take an original text, cut it up, and rearrange it to create a new text. Tristan Tzara is credited with, if not originating the form, then being one of its earliest practitioners. But if one goes back half a century, one can find Baudelaire, in his dedicatory letter to Arsène Houssaye in *Le Spleen de Paris* (Baudelaire 2008, 3), suggesting that he wrote the work with this kind of textual mutilation in mind:

> We can cut wherever we like—me, my reverie, you, the manuscript, and the reader, his reading; for I don't tie the impatient reader up in the endless thread of a superfluous plot. Pull out one of the vertebrae, and the two halves of this tortuous fantasy will rejoin themselves painlessly. Chop it up into numerous fragments, and you'll find that each one can live on its own. In the hopes that some of these stumps will be lively enough to please and amuse you, I dedicate the entire serpent to you.

The form was revived in the 1950s by William Burroughs and Gregory Corso, who cut up Rimbaud's "A une raison" and produced two disjointed fragmentary texts called "Everywhere March Your Head" and "Sons of Yours In" (Perloff 1993, 5).

This inspired me to try an experiment based on "cut up." I had just read a poem by John Ashbery published in the *Boston Review* (May 2016) that began:

> *A Disservice*
> Life with its sorrow, life with its tear.
> And you know what that means:
> the sky in a drawer,
>
> the underwear underworld
> on the floor of the moon.

Downloaded from http://direct.mit.edu/books/book-pdf/2437419/book_9780262356947.pdf by guest on 21 November 2024

> Under the emergency lamps a small panic was growing,
> keeping to itself, chiming
> ahead of your headlights, wobbly.

It goes on like that for another 11 lines, ending enigmatically:

> It's not immortality,
> these mechanical trees, alders.
> Good to know you're not killing them all yourself
> across the street baby.

When I first read "A Disservice," I could make neither head nor tail of it. Here it was published in a reputable journal where a serious group of poetry editors had selected it for publication and therefore for the pleasure of its readers. Only in my case it wasn't so much pleasure as consternation. What was going on here?

I sought the advice of a friend, an excellent poet in his own right, who actually teaches Ashbery at MIT. He thought, perhaps, the poem was about an adult looking back on his secret gay adolescent self. He admitted his interpretation was a stretch. A member of a lecture audience thought it might be about abortion.

In the face of this uncertainty, I wondered what would happen if I rearranged the poem's parts. I didn't change a word. I simply reordered the sentences, coming up with four different versions alongside the original. I asked an MIT colleague who happened to be teaching a writing class to present the original and the four "cut up" versions to his students. I asked him to ask the students which version was the best. My thought was that if the students identified the original, then something accessible was indeed going on, something about the narrative or the flow of images, that I was blind to. Perhaps I could learn from the students. (To avoid number bias, the poems were identified with symbols—!, @, #, $, %—rather than numbers.) The result was that not one of the six students thought the original version was the best.

I tried this experiment a second time at a talk I was giving. Six members of the audience agreed to rank the versions. Not one preferred the original.

I mention this as a curiosity. It is odd that if you cut up this poem as I did—though how could you tell that it was cut up?—12 readers could not flush out the original. What can we conclude from this? Not very much since the sample size is so small. But it is suggestive. In a certain

Downloaded from http://direct.mit.edu/books/book-pdf/2437419/book_9780262356947.pdf by guest on 21 November 2024

kind of poetry, narrative doesn't count for much—so looking for one may well be a wild goose chase.

You can't cut up Keats's "How Many Bards Gild the Lapses of Time" like this. Its narrative is apparent. Its structure is inflexible. The rhyme scheme sees to that. Indecipherability is the hallmark of private format art. In this respect, it is ironic that Ashbery would be so inaccessible, since he so admired Keats. On the other hand, he was also an admirer of the surrealists and of his contemporaries in the New York School of painting. I couldn't help but notice that if you turn the images of "A Disservice" into their visual counterparts—sky in a drawer, floor of the moon, emergency lamps, mechanical trees—and paste them on a sheet of paper, you would have an evocative collage.

Poetry and painting without narrative are the counterpart of atonal music. Just as Ashbery and Duchamp provide a disconnected set of images in search of a narrative, so, too, does atonal music provide an arbitrary set of tones in search of a musical structure. Schoenberg's *Six Pieces*, not without its allure, comes across as a series of unconnected musical gestures. "A Disservice" and "These Lacustrine Cities" read like unconnected verbal ones.

The inaccessibility of contemporary poetry has not gone unnoticed. H. T. Kirby-Smith (1998, 36) makes essentially the same point:

> Much contemporary poetry lacks any sense of accountability to the reader and, as natural consequence, is not much read, though the blame for this neglect is laid by poets on the ignorance of the reading public, somewhat as the pastors of shrinking congregations are apt to blame the faithlessness of the times.

Certainly, the lack of accountability wasn't news to Ashbery himself. Indeed, he knew perfectly well what he was about, as the following comment from one obituary attests (Orr and Smith 2017).

> Yet despite his literary celebrity, he remained for many readers enigmatic.
>
> It was a situation of which Mr. Ashbery was well aware, and which he generally met with gentle, amused frustration. Asked by an interviewer for NPR in 2005 whether his poems were "accessible," he responded, "Well, I'm told that they're not."
>
> He continued: "What they are is about the privacy of all of us, and the difficulty of our own thinking."

That final comment suggests that Ashbery not only made use of deliberate and unashamed privacy as a format, but raised it to the level of

Downloaded from http://direct.mit.edu/books/book-pdf/2437419/book_9780262356947.pdf by guest on 21 November 2024

a genre. It is no surprise that he had a lifelong interest in Dadaism and surrealism. In his Dada Manifesto of 1918, Tristan Tzara wrote:

> *Art is a private affair* [italics mine], the artist produces it for himself, an intelligible work is the product of a journalist. … When a writer or artist is praised by the newspapers, it is a proof of the intelligibility of his work: wretched lining of a coat for public use; tatters covering brutality, piss contributing to the warmth of an animal brooding vile instincts. Flabby, insipid flesh reproducing with the help of typographical microbes.

He could have had Ashbery in mind when he wrote those words. I suppose that, if anything, is the Easter egg behind Ashbery's poem. It is a private matter. Nothing is out in the open. Perloff has made a virtue of this.

Ashbery was an admirer of John Cage, one of the most influential avant-garde composers of the twentieth century. This is not surprising since Cage and the Dadaists had much in common. For example, in 1960 Cage appeared on a TV program entitled *I've Got a Secret*, hosted by Gary Moore. A video from February 1960 records that occasion.[26] Here is part of the conversation leading up to Cage's performance:

Gary Moore: Now, Mr. Cage, I know that you teach a course in experimental sound at the New School.

John Cage (correcting): Experimental music.

Gary Moore (repeating): Experimental music.

John Cage: Yes.

Gary Moore: Will you tell us quite seriously whether or not you consider what we are about to hear music? No tongue in cheek, but seriously.

John Cage: No, perfectly seriously, I consider music the production of sound and since in the piece which you will hear I produce sound, I will call it music.

The composition that follows, *Water Walk*, consists of a series of sounds produced using a variety of implements: a water pitcher, a goose call, a quail call, a whistle, a mechanical fish, a rubber duck, an iron pipe, a noisemaker, a blender with ice cubes, five radios, a tape recorder, a piano, a seltzer siphon, a bottle of wine, a partially filled bathtub, a vase of roses, a watering can, the lid of a trash can, a pressure cooker filled with steam, to name just a few.

As the interview suggests, Cage wants to expand the idea of music to include any sound sequence whatsoever. In *Water Walk*, watering

Downloaded from http://direct.mit.edu/books/book-pdf/2437419/book_9780262356947.pdf by guest on 21 November 2024

flowers, knocking radios to the floor,[27] releasing steam from a pressure cooker, and turning on a blender partially filled with ice cubes are just a few of the sounds of the composition.

Taken at face value, the assertion that music is "the production of sound" would entail that, if read aloud, the sentence I am writing now is a musical performance and that the written sentence is the score. That can't be right. Something else must be going on.

To call *Water Walk* music implies that, like music over the centuries, this expanded genre is also rule-based. But there really are no discernible rules here—no grouping, no tonal center, no metrical structure. There is just Cage walking through a collection of noisemakers loosely connected with the idea of water and the provocative challenge of listening to the sounds as if you were at the Salle Pleyel.

I think that Cage's most famous composition, *4′33″*, might shed some light. It consists of 4 minutes and 33 seconds of silence performed by a "pianist," who sits at a piano with a stopwatch in hand and at measured intervals opens and closes the piano lid to mark the beginning of each of the three movements. This is how John Adams (2010), a well-respected contemporary composer, assesses *4′33″*:

> John Cage['s] … most famous piece called for the performer not to make a single sound. … [H]e upended long-held conventions about the listening process and prodded us to re-evaluate how we define not only music but the entire experience of encountering art. He was, in the words of Kenneth Silverman's new biography [*Begin Again*], "driven by an ideal of nonmythic listening and seeing, of perceptual innocence"; his goal was to compose "a prelapsarian music untainted by history."

For Adams, Cage is upending conventional listening and redefining music. But what is the new definition? Music can't be both "the production of sound" and the production of silence. Just before one performance where Cage himself is the performer, he paraphrases the famous Socratic paradox *I know one thing. I know nothing*. Cage's actual words are, "I have nothing to say, and I am saying it."

I think it is clarifying to think of *Water Walk* and *4′33″* outside of their "musical" context. If, as Cage said on *I've Got a Secret*, music is "the production of sound," then *4′33″* can't be music. It would be pointless to listen to *4′33″* with one's eyes closed. But watching a "pianist" "play" *4′33″*, right arm poised motionless in midair for more than a minute, is

Downloaded from http://direct.mit.edu/books/book-pdf/2437419/book_9780262356947.pdf by guest on 21 November 2024

another story altogether. What is it, then? It is performance art. Watching it is like watching a mime at work.

Water Walk is not silent. But the sounds in themselves are incoherent. If you were to blindfold someone and lead them to a venue where *Water Walk* was being performed, I doubt they could tell you they were listening to music. That perspective comes from the context, a concert hall or the TV show with Cage telling you it's music. To listen to the piece with one's eyes closed the way one might listen to a piano sonata would be pointless, merely a train of disconnected noises. But watching Cage jog from one noisemaker to another, stopwatch in hand, raising a rubber duck on high so everyone can see before he squeezes it, is quite another thing. Cage is quite literally performing. It is no accident that *Water Walk* received its premiere on a TV show.[28]

In a review of John Cage's collected letters, Tim Page (2016) says:

> He opened doors—floodgates, really—and dissolved definitions; if most of his own compositions now seem less interesting than the ramifications of his ideas, there can be little doubt that his oceanic spirit changed the topography.

Page touches on the truth of the matter. John Cage was to mid-twentieth-century music what many of the hundreds of schools were to painting. They were changing the rules of the game called *Making and Appreciating Art*. But they were leaving it up to the audience to discover the rules. One sits through *4′33″* and asks, "What is he trying to say?" If we take Cage at his word, the answer is "Nothing." As we saw with Wallace Stevens, not much help there.

Arthur Danto (1995, 28) writes:

> An historian of my acquaintance, Phyllis Freeman, has taken the manifesto as her topic of research, of which she had unearthed roughly 500 examples, some of which—the surrealist manifesto, the futurist manifesto—are nearly as well known as the works they sought to validate.

Today we remember the names of many of these movements much more than we do their works. Here, Fred Lerdahl (1992, 101) comments insightfully on the state of affairs represented by musical experimentalists from Schoenberg through Cage:

> In the Western tradition the trouble began with the exhaustion of tonality at the turn of the century. Anything became possible. Faced with chaos, composers reacted by inventing their own compositional grammars. Within an avant-garde aesthetic it became possible to believe that one's own new system was the wave of the future.

Downloaded from http://direct.mit.edu/books/book-pdf/2437419/book_9780262356947.pdf by guest on 21 November 2024

Lerdahl is echoing Stravinsky's earlier remarks (1947, 72–73, 74):

> It just so happens that our contemporary epoch offers us the example of a musical culture that is day by day losing the sense of continuity and the taste for a common language.
>
> Individual caprice and intellectual anarchy, which tend to control the world in which we live, isolate the artist from his fellow-artists and condemn him to appear as a monster in the eyes of the public; a monster of originality, inventor of his own language, of his own vocabulary, and of the apparatus of his art. The use of already employed materials and of established forms is usually forbidden him. So he comes to the point of speaking an idiom without relation to the world that listens to him. His art becomes truly unique, in the sense that it is incommunicable and shut off on every side. The erratic block is no longer a curiosity that is an exception; it is the sole model offered neophytes for emulation.[29] …
>
> [T]he day[s] when Haydn, Mozart, and Cimarosa echoed each other in works that served their successors as models … have given way to a new age that seeks to reduce everything to uniformity in the realm of matter while it tends to shatter all universality in the realm of the spirit in deference to an anarchic individualism.

Among the high arts of poetry and music, then, there was an astonishing revolution whereby practitioners turned private formats into an art form.[30] That happened in painting also—but, in the case of at least one renowned painter, it happened with an unexpected twist.

Downloaded from http://direct.mit.edu/books/book-pdf/2437419/book_9780262356947.pdf by guest on 21 November 2024

Downloaded from http://direct.mit.edu/books/book-pdf/2437419/book_9780262356947.pdf by guest on 21 November 2024

10

Recursion: A Shared Format?

After a survey of the modern and postmodern high arts and humanities in his book *The Blank Slate*, Steven Pinker (2002, 411–412) sums up as follows:

> Once we recognize what modernism and postmodernism have done to the elite arts and humanities, the reasons for their decline and fall become all too obvious. The movements are based on a false theory of human psychology, the Blank Slate.

Pinker's value judgment concerning the fruits of (post)modernism is not universally accepted. Thus, with respect to painting Vered Aviv (2014) notes:

> Combining behavioral and low-resolution electromagnetic tomography analysis, Lengger et al. (2007) demonstrated that observers preferred abstract and representational paintings in an equal manner. … Comparing brain activity in response to representational and abstract paintings revealed significantly higher activation for representational art works in several brain regions, predominantly in the left frontal lobe and bilaterally in the temporal, frontal and parietal lobes, limbic system, insula and other areas as well. Increased brain activity in response to representational art was mostly attributed to the process of object recognition, and the activation of memory and associations systems.

In other words, different parts of the brain respond depending upon whether one is looking at abstract or representational art. This certainly fits nicely with the underlying hypothesis of this book.[1] Premodern art appealed to privileged categories of the brain. Postmodern art looks elsewhere. For Aviv that difference is a happy one:

> [A]bstract art is a very recent (100 years old or so) invention of the human brain. … Supported by recent experimental studies, I claim that abstract art frees our brain from the dominance of reality [i.e., the natural aesthetic], enabling the brain to flow within its inner states, create new emotional and cognitive associations and activate brain-states that are otherwise harder to

Downloaded from http://direct.mit.edu/books/book-pdf/2437419/book_9780262356947.pdf by guest on 21 November 2024

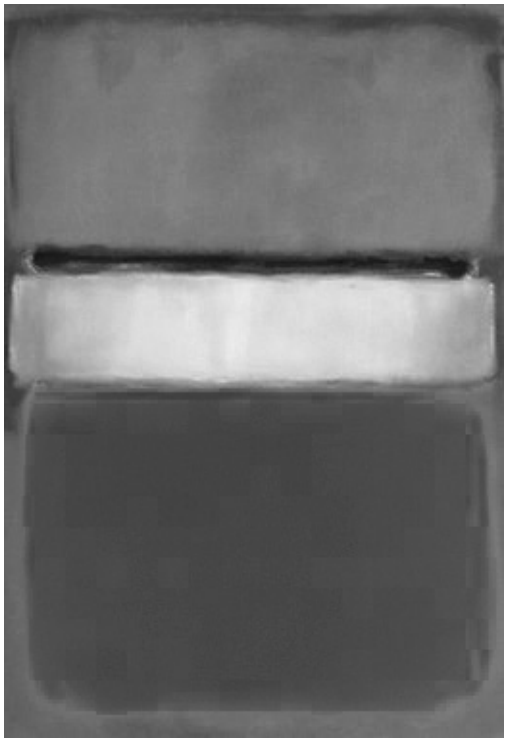


Figure 10.1
Mark Rothko, *White Center*, 1950. © 1998 Kate Rothko Prizel & Christopher Rothko / Artists Rights Society (ARS), New York.

> access. This process is apparently rewarding as it enables the exploration of yet undiscovered inner territories of the viewer's brain.

Aviv would, I suspect, be sympathetic to a comment by Mark Rothko (Kedmey 1999 [2004]):

> I'm interested only in expressing basic human emotions—tragedy, ecstasy, doom, and so on. And the fact that a lot of people break down and cry when confronted with my pictures shows that I can communicate those basic human emotions. … If you … are moved only by their color relationships, then you miss the point.

I thought this was a stretch. I was among those who "miss the point." I happened to mention this to a friend of mine one day. She told me that when she first viewed *White Center* (see figure 10.1), she did, indeed, burst into tears.

Downloaded from http://direct.mit.edu/books/book-pdf/2437419/book_9780262356947.pdf by guest on 21 November 2024

Figure 10.2
Jackson Pollock, *One: Number 31*, 1950. © 2019 The Pollock-Krasner Foundation / Artists Rights Society (ARS), New York.

Aviv's motivation in writing her article is this:

> It is … intriguing to try and understand why we are attracted to abstract art (as demonstrated by the huge success of museum exhibitions of the abstract artwork, such as those of Jackson Pollock).

From Aviv's point of view, a Pollock painting (and, perhaps, a Rothko painting) is attractive because it has helped the brain "to create new emotional and cognitive associations and activate brain-states that are otherwise harder to access." But there is another possible explanation for the popularity of Pollock's paintings, even among children.[2]

Jackson Pollock is the most famous practitioner of the school of painting called abstract expressionism. There is no doubt that abstract expressionism had a huge impact on the American art of the mid-1950s. Pollock himself was considered by some to be the greatest living American artist of the time. His painting *One: Number 31* (1950) (see figure 10.2) was important enough for E. H. Gombrich to award it the only double-page pullout in his famous book *The Story of Art* (1995 edition).

The style on which his considerable reputation is based is drip painting, a way of applying paint to canvas that was actually introduced much earlier than the mid-twentieth century by, among others, surrealist artists like André Masson and Max Ernst. Janet Sobel is credited with having directly introduced Pollock to the technique.

Downloaded from http://direct.mit.edu/books/book-pdf/2437419/book_9780262356947.pdf by guest on 21 November 2024

This is what Gombrich (1995, 602–603) has to say about the Pollock phenomenon:

> Pollock had been captivated by surrealism, but he gradually discarded the weird images that had haunted his paintings for exercises in abstract art. Becoming impatient of conventional methods, he put his canvas on the floor and dripped, poured or threw his paint to form surprising configurations. … He probably remembered stories of Chinese painters who had used such unorthodox methods and also the practice of American Indians who make pictures in the sand for magic purposes. The resulting tangle of line satisfies two opposing standards of twentieth-century art: the longing for childlike simplicity and spontaneity that evokes the memory of childish scrawls at the time of life before children even start to form images; and, at the opposite end, the sophisticated interest in the problems of 'pure painting'. Pollock has thus been hailed as one of the initiators of a new style known as 'action painting' or Abstract Expressionism.

Pollock's art appears to be a perfect example of the private format. Or maybe not. The critic Robert Coates once derided a number of Pollock's works as "mere unorganized explosions of random energy, and therefore meaningless."[3] His paintings are literally scrawls of drips and swirling lines, resembling nothing. However, there is evidence that a method lurks behind all that supposed meaninglessness.

As I said earlier, it does not follow that a private format is necessarily an alien format with respect to hardwiring of the brain. Just because they set aside the "privileged categories" of face, place, and body does not mean that the new art forms were all based on inaccessible constructs of the artist's general intelligence that the audience "got" only after playing catch-up. One can imagine that artists, having dropped shared formats to search for new ones, might hit upon formats that were just as shareable as those of the premodern practitioners. Pollock's drip-painting productions may be a case in point.

The physicist Richard P. Taylor and his coauthors report on work connected to their prior discovery that Pollock's drip paintings are, in fact, fractal (2002, 2005). This discovery raised certain questions (Taylor et al. 2002, 203):

> However, it was not until 1999 that we … identified the defining visual character of his patterns as fractal … —bearing the "fingerprint" of Nature's patterns … , leading us to label Pollock's work "Fractal Expressionism" … . This discovery has triggered a multi-disciplinary debate over the precise process that Pollock used to generate his fractal patterns. For art theorists, the artistic significance of Pollock's fractals lies in the process of their generation. Pollock's

Downloaded from http://direct.mit.edu/books/book-pdf/2437419/book_9780262356947.pdf by guest on 21 November 2024

> method also offers an intriguing comparison for scientists studying fractal generation in Nature's systems. For psychologists, the process allows an investigation of the fundamental capabilities and limits of human behavior. How did a human being create such intricate patterns with such precision 25 years ahead of their scientific discovery?

Taylor and colleagues (2002, 206) opine that Pollock had created an art form based on a shared neural predilection of the artist and his audience:[4]

> A recent survey … revealed that, out of 120 people questioned, over 90% of subjects found fractal imagery to be more visually appealing than non-fractal imagery, and it was suggested that this choice was based on a fundamental appreciation arising from humanity's exposure to Nature's fractal patterns. … *The survey highlights the possibility that the enduring popularity of Pollock's Fractal Expressionism is based on an instinctive appreciation for Nature's fractals shared by Pollock and his audience* [italics mine].

Everything rides on that term *instinctive appreciation*. References to American Indian sand painting and to Chinese painters who used methods of paint application unknown in the West are interesting, as are suppositions about longings for childlike simplicity, but they really don't get at the heart of what Pollock is doing. "His method is like American Indian sand painting" or "His scrawls are meant to recall childhood simplicity" are just observations. There is nothing simple, I think, in a Pollock.

If, on the other hand, Taylor and colleagues are right, then there might be a place in the brain, like the fusiform gyrus, that is dedicated to processing recursive structures in the real world. That is to say, Pollock may have created an art form that he and his audience could share by virtue of a shared neural architecture devoted to recursiveness. A cognitive subsystem might be lending a hand in "sorting out" the data of a Pollock painting just as Broca's center does for language.

There is experimental evidence in favor of this conjecture. Maurício Dias Martins (11) and colleagues (2014) conducted experiments to investigate the relation between visual self-similarity (i.e., fractals) and grammar comprehension. Specifically, they tested children's ability to process fractal images and their ability to process recursive grammatical structures, the kind that repeat themselves over and over again (e.g., *John said that Bill said that Mary said that Frank said that Jennifer said …*):

> Our goal was to investigate how the ability to represent hierarchical self-similarity develops in the visual domain, and how this ability can be predicted by individual differences in intelligence, grammar comprehension and general visual processing. (Martins et al., 2014, 11)

Downloaded from http://direct.mit.edu/books/book-pdf/2437419/book_9780262356947.pdf by guest on 21 November 2024

In devising the study, they reasoned as follows:

> If recursion is the core computational operation of syntactic operations (Chomsky, 2010), and if open-ended representations of self-similar hierarchies depend on the use of linguistic resources (Fitch, Hauser, & Chomsky, 2005; Hauser et al., 2002), we would expect to find a strong and specific correlation between grammar comprehension and visual recursion. Alternatively: (1) if visual and linguistic hierarchical processing systems are completely independent, we would expect to find no correlation between these two domains; (2) if there are shared cognitive resources between language and visual hierarchical processing, not specifically related to recursion, we would expect to find a general correlation between grammar comprehension and both recursive and iterative visual tasks. (Martins et al., 2014, 13)

And indeed, they found a correlation between processing visual self-similarity and grammar comprehension:

> In this study we assessed for the first time the ability of children to represent hierarchical self-similarity in an unambiguously non-linguistic domain. Consistently with previous findings on language (Miller et al., 1970) and visual-spatial research (Harrison & Stiles, 2009; Poirel et al., 2008), we found that the majority of fourth graders, but not second graders, were able to adequately process visual fractals generated using both recursive and iterative rules. This difference is partially accounted [for] by distinct visual processing efficiency levels, but it is also predicted by grammar comprehension. (Martins et al. 2014, 22)

All of this is consistent with the view that children have neural architecture designed to generate recursive structures and that this ability is correlated with grammatical comprehension.

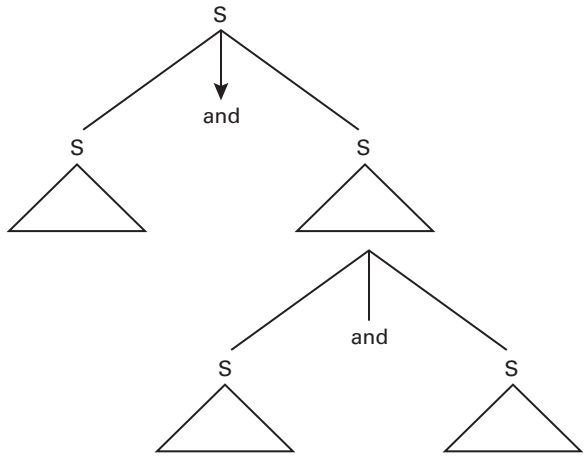
Perhaps it is not too great a leap, then, to suggest that Pollock, in his drip painting, tapped into a hardwired property of mental architecture just as premodern painters had tapped into face, place, and body architecture and premodern composers had tapped into the architecture devoted to tonality. That would put Pollock in the company of artists whose art-making rules were shared in part by their audience.

At this point, it is possible to compare Wallace Stevens and Jackson Pollock. In "The Snow Man," Stevens exploits the human ability to process recursive structures, in this case the embedding of structures inside structures with the help of the conjunction *and*. The relevant grammatical rule is something like this:

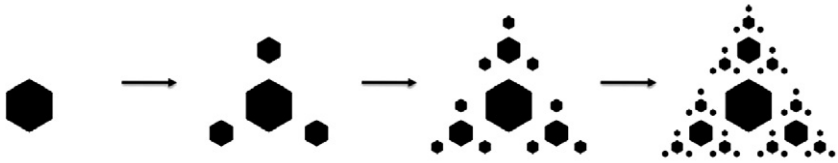
S ⟶ S and S

Downloaded from http://direct.mit.edu/books/book-pdf/2437419/book_9780262356947.pdf by guest on 21 November 2024

yielding a recursive structure like this:



Jackson Pollock may have exploited the same ability to process recursive structures, in this case the recursive nature of fractals. This illustration from Martins and colleagues' article (2014, fig. 2) demonstrates how a fractal works recursively:



This is speculative, of course. Still, it is worth thinking about in terms of a postmodern natural aesthetic. If visual recursiveness of the fractal variety and grammatical recursiveness are neurally hardwired, then it might well be that Stevens and Pollock, in search of new formats, made contact with recursion. It is even possible that the same neural mechanism is involved in both art forms. As Martins and colleagues (2014, 22) point out:

> [T]he re-organization of brain networks … , for instance, the myelination of the superior longitudinal fasciculus (occurring around the ages 7–8), seems to increase the efficiency of hierarchical processing (Friederici, 2009).

However, they conclude their article cautiously:

> Although the developmental time course of recursion in language and vision seem to obey similar constraints, this study does not provide direct evidence that the same cognitive machinery is used in both domains.

Downloaded from http://direct.mit.edu/books/book-pdf/2437419/book_9780262356947.pdf by guest on 21 November 2024

This recourse to visual recursion in the arts is not new. In an interesting article on the role of the golden mean in aesthetics, Christopher Nicholas and Thomas Bever (2016) have demonstrated the importance of recursion in landscape painting. The authors start by observing that nineteenth-century American and British landscape painters showed a marked preference for canvas shapes that made use of the golden mean. They hypothesize (2016, 6) that

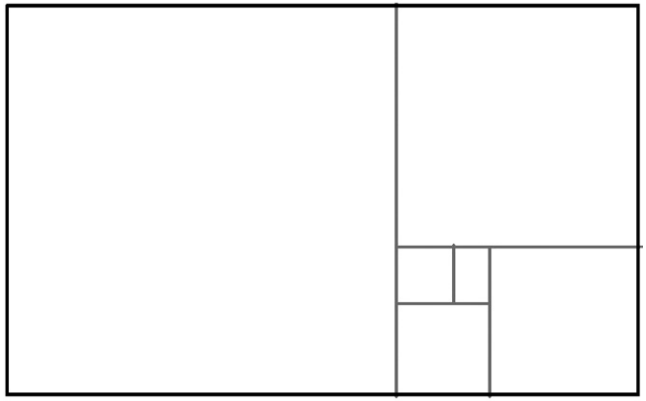
> golden section rectangles elicit initial visual representations in two dimensions that stimulate three-dimensional representations. We show that this perceptual process correctly predicts enhanced depth perception within golden section frames compared to frames of other proportions (Bever, 1986). This is the first report of the influence of frame shape on depth perception, the first demonstration that the golden section rectangle enhances depth perception, and the first demonstration grounded in modern visual theories of *why* the golden section rectangle is aesthetically satisfying.[5]

This result is of interest because the golden mean section is, in fact, recursive in nature (Nicholas and Bever 2016, 9):

> Perceptual processing of a golden rectangle via decomposition into squares results in a square and another golden rectangle 1/φ the size of the original and rotated 90° … ; unlike the decomposition of simpler ratios, this process is indefinite because a golden rectangle always remains after each iteration. … It is the only ratio that replicates itself each time a square is subtracted and is unique in having a recursive analysis in one step each time. … The salience of repeating patterns at the same and different levels of representation has been noted as contributing to aesthetic interest in such fine-art domains as music … and modern mathematical domains as fractals. … The simultaneous simplicity and completeness of the analyses of the golden rectangle may afford an optimal level of complexity because the same function is used iteratively. Simpler shapes are "uninteresting" because they are completely resolved representationally in a few steps.

Nicholas and Bever illustrate the decomposition of a golden rectangle as shown below. Each time a perfect square is drawn whose sides match the shorter side of the rectangle, what remains is itself a golden rectangle. The figure shows that manipulation through five iterations.

Downloaded from http://direct.mit.edu/books/book-pdf/2437419/book_9780262356947.pdf by guest on 21 November 2024



The use of the golden mean to construct images both in filmmaking and in photography is well-known. In fact, the standard 35 mm format used in the motion-picture industry is based on the golden rectangle, as was 35 mm film for still cameras. That is, the 1.5:1 ratio of the 35 mm format is close to the l.618:1 of the golden mean.

Gombrich's (1995, 605) discussion of the works by Franz Kline (1910–62) and Pierre Soulages (1919–) shown in figures 10.3 and 10.4 offers examples of how modernist artists did not altogether abandon mimetic devices. On the surface, these works appear quite abstract. But Gombrich's commentary is suggestive:

> It is characteristic that Kline called his paintings "White forms." He obviously wanted us to pay attention not only to his lines but also to the canvas which they somehow transform. For, simple as are his strokes, they do result in some impression of a spatial arrangement, as if the lower half were receding towards the centre. To me, though, the painting by Soulages looks more interesting. The gradation of his energetic brushstrokes also results in the impression of three dimensions, but at the same time the quality of the paint looks more pleasant to me—though these differences hardly come through in an illustration.

His discussion centers around the function of the brain to intuit distance via perspective lines and via the trick of creating a sense of depth by placing lighter colors in front of darker ones (see the discussions of William Hogarth's *The Orgy* and John Constable's *Wivenhoe Park,* respectively, in chapter 8). It might not be a coincidence, then, that both Kline's and Soulages's canvases are very close in size to the golden rectangle—(74⅜ × 50¼) and (74¾ × 51¼), respectively. Nicholas and Bever (2016) provide a rationale for why Kline and Soulages might have made that choice even if their choice was not a conscious one.[6]

Downloaded from http://direct.mit.edu/books/book-pdf/2437419/book_9780262356947.pdf by guest on 21 November 2024

Figure 10.3
Franz Kline, *White Painting*, 1950. © 2019 The Franz Kline Estate / Artists Rights Society (ARS), New York.

Let's return for a moment to Rothko's *White Center*. To begin with, the painting does approximate the golden mean. The top of the whitish bar in the center pretty much divides the canvas into a 1:1.6 golden mean space. That in itself can't be a sufficient reason to burst into tears. The golden mean is a property of thousands of paintings. But it may well be that for certain viewers the connection between colors and emotions is like the synesthetic connection between colors and number shapes. If this were the case, then Rothko's painting would be, like Pollock's, an example of an artist catering to a hitherto unappreciated (in this context) privileged category of the brain.[7]

Downloaded from http://direct.mit.edu/books/book-pdf/2437419/book_9780262356947.pdf by guest on 21 November 2024

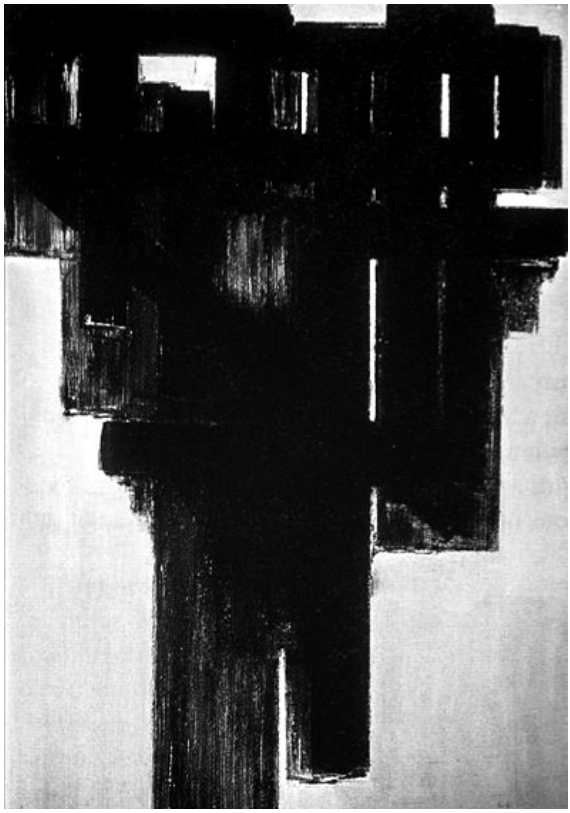


Figure 10.4
Pierre Soulages, *3 Avril 1954*, 1954. © 2019 Artists Rights Society (ARS), New York / ADAGP, Paris.

In this chapter, I have reviewed work that points to unexpected links between what an artist uses to create a work of art and what a viewer or listener uses to experience it.[8] In particular, it might well be that recursiveness should be included in the list of designated categories that play a role in the production and perception of poetry, painting, and music.[9]

At this point, there is something about music that needs airing (pun intended). The rules that I have adopted for music are those presented in Lerdahl and Jackendoff 1983. Leonard Bernstein (1976, 273) described the predicament that arose when these rules, or something like them, were abandoned for the sake of atonality:

Downloaded from http://direct.mit.edu/books/book-pdf/2437419/book_9780262356947.pdf by guest on 21 November 2024

> It was soon to become clear that free atonality was itself a point of no return. … Where did one go from here, having abandoned all the rules? For one thing the lack of constraints and the resulting ungoverned freedom produced a music that was extremely difficult for the listener to follow, in either form or content. This remained true in spite of all the brilliant and profuse inner structures that abounded in a piece like *Pierrot Lunaire*—canonic procedures, inverted phrases, retrogrades, and the like. Moreover, it was not easy for the composer to maintain his atonality, because of that innate tonal drive we all share universally.

Fred Lerdahl (1989, 84) offers a compelling answer to Bernstein's question, "Where did one go from here?":

> The crux of the theory … is the decision to regard contextual salience in atonal music as analogous to stability in tonal music. This step amounts to an acknowledgement that atonal music is not very grammatical. I think this is an accurate conclusion. Listeners to atonal music do not have at their disposal a consistent, psychologically relevant set of principles by which to organize pitches at the musical surface. As a result, they grab onto what they can: relative salience becomes structurally important, and within that framework the best linear connections are made.

This explains why, as Bernstein notes, atonal music is filled with "brilliant and profuse inner structures that abounded in a piece like *Pierrot Lunaire*—canonic procedures, inverted phrases, retrogrades, and the like." They are intended as a substitute for tonality. Lerdahl observes (p. 73) that unlike the pitch space of tonal music, the pitch space of atonal music is flat. This is crucial to what he means when he says that atonal music "is not very grammatical." It has abandoned the notion of stability. In Lerdahl's terms (p. 74):

> Given that two events connect, the more *stable* is the one that is more consonant or spatially closer to the (local) tonic; the more *salient* is the one that is in a strong metrical position, at a registral extreme, or more significant motivically.[10] [Italics in original.]

For Lerdahl, atonal music is about salience, all those "inner structures," and not stability. One implication of this is that hierarchy in Lerdahl and Jackendoff's (1983) sense does not play a role in atonal music. Their notion of hierarchy corresponds to what I have called recursion. I have suggested that recursion may be one of the dedicated categories the natural aesthetic is attuned to. The difficulty of atonal music is consistent with this suggestion. That is to say, by abandoning hierarchy (recursion), atonal music moved away from the natural aesthetic.

Downloaded from http://direct.mit.edu/books/book-pdf/2437419/book_9780262356947.pdf by guest on 21 November 2024

It might well be that recursiveness is actually just one technique in a larger framework. I am thinking of repetition, which plays such a major role in metrical verse and in music.[11] From that perspective, recursion might just be one technique for producing repetitive patterns.

Elizabeth Margulis (2014, 15–16) reports on an experiment that demonstrates the importance of repetition and music:

> In a 2012 study, I asked participants without special musical training—everyday music listeners—to listen to excerpts from challenging contemporary art music (atonal pieces by Luciano Berio and Elliott Carter) and rate on a 7-point scale how much they'd enjoyed each excerpt, how interesting they'd found it, and how likely they thought the excerpt was to have been composed by a human artist rather than randomly generated by a computer. … Unbeknownst to the participants, mixed in with the original excerpts were adaptations of them. In these adaptations, segments of music had been extracted and reinserted to add repetitions of some material; repetitions that could occur immediately or after some other music had intervened. … Listeners rated the immediate and delayed repetition versions as reliably more enjoyable, more interesting, and more likely to have been composed by a human artist rather than generated randomly by a computer. Even roomfuls of PhD-holding music theorists, when presented these examples at a meeting of the Society for Music Theory (Minneapolis, 2011)—an audience sympathetic to Berio and Carter if ever there were one—confessed to finding the versions more likable on first pass. This is a stunning finding, particularly as the original versions were crafted by internationally renowned composers and the (preferred) repeated versions were created by brute stimulus manipulation without regard to artistic quality. The simple introduction of repetition, independent of musical aims or principles, elevated people's enjoyment, interest, and judgments of artistry. This suggests that repetition is a powerful and often underacknowledged aesthetic operative.

Indeed, Margulis (2014, 15) argues that this demonstration shows that "[r]epetition … marks an important divider between the perception of music and language." She may well be right in this conclusion. However, there is another possibility worth putting on the table. Perhaps repetition introduces hierarchy and that hierarchy taps into a dedicated functionality of the brain. In other words, introducing repetition tends to move atonality in the direction of tonality by virtue of introducing, in Lerdahl's terms, stability.

Finally, I suspect that the appeal of metrical poetry will someday be shown to cater to the repetitive sensitivity of the brain along with music and painting since it too exhibits, to a limited degree, hierarchical structure.[12]

Downloaded from http://direct.mit.edu/books/book-pdf/2437419/book_9780262356947.pdf by guest on 21 November 2024

I can think of at least one more possible linkage between the sister arts. Anjan Chatterjee (2014, 45) discusses a phenomenon known as peak shift.

> Many years ago, the ethologist Tinbergen … observed that herring gull chicks get adult gulls to regurgitate food by tapping on a red spot on an adult gull's yellow beak. The chicks also peck at a red dot on a yellow stick if that stick replaces a beak. If more red dots are painted on the stick, the chicks peck even more vigorously even though they have never actually seen such a strange object in nature. This phenomenon of an exaggerated response (the peak response) to exaggerated versions (the shifted version) of the stimulus that would evoke a normal response is called the "peak shift."

V. S. Ramachandran (2004, 42ff.) considers the peak shift one of eight "universal laws of art." He sees it at work, for example, in Indian temple art where female deities are endowed with physical characteristics exaggerated to the point of impossibility. These so-called caricatures, he suggests, result from an innate preference for peak-shifted properties.[13]

One possible example of peak shift in what we have discussed thus far is the stress maximum. In chapter 6, I suggested that it is not just word stress strategically placed in a metrical line, but word stress exaggerated as a result of being surrounded by less-stressed syllables. The selection of this particular definition of a stress maximum might well be the result of the peak shift phenomenon. Of course, this depends on the viability of the stress maximum as a metrical measure. But should it survive, it would constitute an interesting example of how hardwired preferences of the peak shift variety play a role in rules represented in brain anatomy, something that most neuroaesthetic accounts omit.[14]

I reluctantly leave the discussion of linkages between the sister arts and privileged categories of the brain and their possible functions—as intrinsically interesting as that topic is—to turn to the ultimate point of this book. But before I do, I would like to make a programmatic comment relating to neuroaesthetics. In an interview with MIT Press's *The Reader* (https://thereader.mitpress.mit.edu/steven-pinker-interview/), Steven Pinker comments:

> Cognitive science emerged in the 1970s when it became apparent that experimental psychology by itself was insufficient to understand the human mind; it needed injections of theory from theoretical computer science and philosophy, together with information about the richness of language from linguistics. Cognitive science itself became overshadowed by neuroscience in the 1990s and artificial intelligence in this decade, but I think those fields will need to

Downloaded from http://direct.mit.edu/books/book-pdf/2437419/book_9780262356947.pdf by guest on 21 November 2024

> overcome their theoretical barrenness and be reintegrated with the study of cognition—mindless neurophysiology and machine learning have each hit walls when it comes to illuminating intelligence.

Pinker's admonition is a warning shot across the bow of artistic intelligence as well. Virtually none of the neuroaesthetic studies I have encountered in the course of writing this book make use of the level of mental representation exemplified by rules as a way of characterizing human intelligence. Doing just that has been of revolutionary importance in understanding the ability of human beings to acquire and use language. I have tried to extend that rule-oriented perspective to aesthetic behavior. That step has enabled me to put on the table a new account of the startling changes that occurred in the sister arts at the turn of the twentieth century, a cognitive account centered on rules rather than cultural phenomena. We will see in the next two chapters how this perspective allows modernism to join hands with another intellectual revolution, 200 years earlier.

Downloaded from http://direct.mit.edu/books/book-pdf/2437419/book_9780262356947.pdf by guest on 21 November 2024

Downloaded from http://direct.mit.edu/books/book-pdf/2437419/book_9780262356947.pdf by guest on 21 November 2024

11
The End of -isms

Famously, Andy Warhol brought an abrupt end to the New York love affair with abstract expressionism. His now iconic *Campbell's Soup Cans* series refocused art on Vasarian mimesis, albeit with an ironic twist fed by his early career as an illustrator. Warhol combined the realism of mimesis with the ready-made objects of Dadaism and the style of commercial art, dealing what turned out to be a death blow to art -isms of every sort. In Arthur Danto's mind, he is the one who marked the end of the era of ideology.

Danto sees Warhol's move as having been critical in clarifying the relationship between art and reality. He talks about the impact that Warhol made in offering a perfect large-scale replica of a Brillo box (1995, 125):

> The example made it clear that one could not any longer understand the difference between art and reality in purely visual terms, or teach the meaning of "work of art" by means of examples. But philosophers had only supposed one could. So Warhol, and the pop artists in general, rendered almost worthless everything written by philosophers on art, or at best rendered it of local significance. For me, through pop, art showed what the proper philosophical question about itself really was. It was this: What makes the difference between an artwork and something which is not an artwork if in fact they look exactly alike?

Danto (pp. 112–113) acknowledges that the same question was raised by Marcel Duchamp's submission to the 1917 Society of Independent Artists exhibition in New York City. Like Warhol's *Brillo Box*, Duchamp's *Fountain* required a theory to be understood as a work of art. As Danto wrote decades earlier (1964, 572):

> [T]hese days one might not be aware he was on artistic terrain without an artistic theory to tell him so. And part of the reason for this lies in the fact that terrain is constituted artistic in virtue of artistic theories, so that one use

Downloaded from http://direct.mit.edu/books/book-pdf/2437419/book_9780262356947.pdf by guest on 21 November 2024

> of theories, in addition to helping us discriminate art from the rest, consists in making art possible.

In reviewing an exhibition at Yale University, Hilton Kramer (1974) echoed Danto's point of view:

> Realism does not lack its partisans, but it does rather conspicuously lack a persuasive theory. And given the nature of our intellectual commerce with works of art, to lack a persuasive theory is to lack something crucial—the means by which our experience of individual works is joined to our understanding of the values they signify.[1]

E. H. Gombrich's (1956, 281) comments on *Still Life: The Table* by Georges Braque (see figure 11.1) illustrate how useful theories can be:

> [A] still life by Braque … will marshal all the forces of perspective, texture, and shading, not to work in harmony, but to clash in virtual deadlock. Perhaps the most telling of these contradictions is Braque's treatment of light. There are black patches on the apples where Fantin-Latour painted highlights. In thus inverting the relationships, the painter drives home the message that this is an exercise in painting, not in illusion.

Braque had reversed the polarity on one of the "tricks" that mimetic painters had developed to enhance the perception of reality in their paintings. By painting black patches where a mimetic painter (Henri Fantin-Latour) would have introduced a highlight, Braque forces the viewer to

Figure 11.1
Georges Braque, *Still Life: The Table*, 1928.

Downloaded from http://direct.mit.edu/books/book-pdf/2437419/book_9780262356947.pdf by guest on 21 November 2024

see the painting not as a representation but as an arrangement of colors and patterns redolent of a representation.

Poetry, like music and painting, invented its own array of compositional grammars (see the quotation from Lerdahl 1992 at the end of chapter 9)—that is, theories. Perhaps the most famous was imagism, a school of poetry whose name was apparently invented by Ezra Pound when he sent some poems by H. D. (Hilda Doolittle) to Harriet Monroe at *Poetry Magazine* and appended the title *Imagiste* to her name. He thought her poetry would be more acceptable if she were a member of a school. It was rather like the Wizard of Oz giving the Tin Man a testimonial.

Marjorie Perloff's (1993) *The Poetry of Indeterminacy* is a gold mine of references to theories devised to accompany the various schools of modernist poetry. I have already discussed her view of indeterminacy in terms of John Ashbery's "These Lacustrine Cities." In examining Gertrude Stein's "Susie Asado," she says (p. 76):

> [H]er verbal configurations are set up precisely to manifest the arbitrariness of discourse, the impossibility of arriving at "the meaning" even as countless possible meanings present themselves to our attention. … In this sense, Gertrude Stein's style does parallel, as much as the style of any one art can parallel that of another, the instability, indeterminacy, and acoherence of Cubism.

She quotes extensively (pp. 114–115) from William Carlos Williams's commentary/theory on Stein and draws in the views of Guillaume Apollinaire and Viktor Shklovsky:

> Thus the Gertrude Stein of *Tender Buttons* (1914) "has completely unlinked [words] … from their former relationships in the sentence"; she "has gone systematically to work smashing every connotation that words have ever had, in order to get them back clean." Such decomposition is essential, for poetry, as Williams says in the Marianne Moore essay, is a matter of "wiping soiled words or cutting them clean out, removing the aureoles that have been pasted about them or taking them bodily from greasy contexts." …
>
> … Just as the "Cubist" painter recognizes that, in Apollinaire's words, "you may paint with whatever material you please, with pipes, postage stamps, postcards or playing cards, candelabra, pieces of oil cloth, collars, painted paper, newspapers" (1949, 23), so the verbal artist like Gertrude Stein takes words and *unlinks* them "from their former relationships in the sentence." One is reminded of Viktor Shklovsky's famed definition of art as *defamiliarization*, especially the idea that "An image is not a permanent referent for those mutable complexities of life which are revealed through it; its purpose is not to make us perceive meaning, but to create a special perception of the object."

Downloaded from http://direct.mit.edu/books/book-pdf/2437419/book_9780262356947.pdf by guest on 21 November 2024

And she comments on a poem from *Spring and All* by William Carlos Williams (1993, 128):

> Like a Cubist painting, Williams' poem introduces contradictory clues that resist all attempts to apply the test of consistency.

All of these theories are intended to offer help in reading poems whose meaning is indiscernible. There is a famous sentence in Noam Chomsky's (1957) *Syntactic Structures*, intended to demonstrate that syntax and semantics are separate components of grammar. That sentence is, of course, *Colorless green ideas sleep furiously*. The sentence is perfectly grammatical syntactically. However, it makes no sense. That was the whole point. The theoreticians cited by Perloff, including Perloff herself, are at pains to explain why such sentences, though they would never appear in ordinary discourse where communication is at stake, could easily appear in a modernist poem. In fact, *Colorless green ideas sleep furiously* is the verbal counterpart of Warhol's *Brillo Box*. In one context, it is an example sentence in a scholarly monograph. In another context, that provided by a theory of inaccessibility, it is a perfectly acceptable line in a poem.[2]

Theories that attempt to come to grips with the absence of discernible narrative in a poem are unique to modernism. No such explanations were needed when it came to poems like Marvell's "To His Coy Mistress," where there was no room for *Colorless green ideas sleeping furiously*. Every reader could tell what those poems were about. And that goes for pretty much all of English poetry up to the modernists. I am not making a value judgment. When poetry, like painting and music, abandoned the art forms of the natural aesthetic, the art went underground, as it were. Like Dante in Hell, the audience sorely needed a guide.

With the disappearance of discernible narrative lines from poetry, it is not surprising that, after the turn of the twentieth century, a great deal of poetry turned to a different dimension, namely, its look on the page. One thinks of Charles Olson's *Maximus Poems*, for example, or William Carlos Williams's "Red Wheelbarrow." H. T. Kirby-Smith (1998, 249) cites Carole Anne Taylor's (1985, 289) comment on the poetry of Ezra Pound and William Carlos Williams:

> Different from other poetry I have discussed, the very look of the pages suggests that the poetic subject is the poet in the world.

Downloaded from http://direct.mit.edu/books/book-pdf/2437419/book_9780262356947.pdf by guest on 21 November 2024

Kirby-Smith replies to this characterization in an interesting fashion:

> I would put it less kindly, feeling that both Pound and Williams overreached their genuine talents in these works [*The Cantos* and *Paterson*], and remarking that by this criterion our attics, garages, and basements constitute art forms—that is, the "poet in the world" as a subject removes the barriers between ordinary existence with all its random events, vacillations, and indecisions and a work of art as a selected and intensified field of attention. … The best analogy would be to say that in *Paterson* and *The Cantos* we see the interior of the studio. It is art in process, not art as a finished series of works; we may recall that for years *Finnegans Wake* bore the provisional title "Work in Progress," and we may think of Jackson Pollock's action painting and John Cage's musical experiments.

I think Kirby-Smith was quite astute in linking Pound and Williams, Pollock and Cage.[3] Each in his own way was reacting to the abandonment of the natural aesthetic. All three sister arts found refuge in inventions that struck at the heart of the natural aesthetic. Music abandoned tonality for arbitrary sets of notes. Painting abandoned mimesis for emphasis on the materials of the art form, and poetry abandoned linguistic givens like primary stress as the basis for determining the units that made up the line, a critical step toward turning poetry into a visual/typographical art form.

As an interesting sidelight in era ending, many art historians view Édouard Manet's *Le déjeuner sur l'herbe* as the beginning of the end of mimetic art. It is as pugnacious in its way as Warhol's *Brillo Box*. Both paintings have in common that they bookmarked an end. For Manet it was Vasari's mimesis. For Warhol it was abstract expressionism.

The sixteenth-century engraver Marcantonio Raimondi produced a famous engraving called *The Judgment of Paris* after a design by Raphael in whose studio Raimondi worked (figure 11.2). The engraving embodies many of the tropes of classical art: nude figures, drapery-hidden genitalia, mythological figures, and so on. Manet was well aware of this when he painted *Le déjeuner sur l'herbe*. Compare the group of three figures in the lower right-hand corner of Raimondi's engraving (figure 11.3) with Manet's painting (figure 11.4). Ross King (2006, 41) comments on the juxtaposition:

> *Le Bain*[4] was therefore, despite its origins in a Renaissance print, a daringly modern scene not unlike the works of Realism painted by Courbet. It was, in many ways, a defiant painting. Manet had copied or adapted numerous Old Masters, but never had he given his source such an audacious spin. He

Downloaded from http://direct.mit.edu/books/book-pdf/2437419/book_9780262356947.pdf by guest on 21 November 2024

Figure 11.2
Marcantonio Raimondi, *The Judgment of Paris*, 1517–1520

> was not simply copying Raphael—he was cheekily reworking him, turning a mythological scene from one of the most celebrated engravings of the Renaissance into a tableau of somewhat vulgar Parisian holidaymakers in whom the morally fastidious might detect indecent undertones.[5]

King goes on to say that "Manet's painting therefore marked an assault on the bastions of nineteenth-century art." In other words, *Le déjeuner sur l'herbe* was like painting a mustache on Gilbert Stuart's portrait of George Washington (see any dollar bill) or Marcel Duchamp painting a mustache and goatee on a postcard reproduction of the *Mona Lisa*.[6]

By the same token, Andy Warhol's *Campbell's Soup Cans* was an assault. Like Manet's *Déjeuner sur l'herbe*, *Soup Cans* (see figure 11.5) was a defiant painting with its 32 soups, one for each Campbell's variety, rubbing salt in the wound it inflicted on the bastions of twentieth-century art in general and abstract expressionism, the last of the -isms, in particular. (It is an amusing coincidence that both paintings are about lunch.) Of course, there was an important difference between Manet and Warhol. Manet was making a work of art. Warhol was making a statement. In the search for new formats after the abandonment of shared rules, a good deal of modern art veered in the direction of statement-making. A whole

Downloaded from http://direct.mit.edu/books/book-pdf/2437419/book_9780262356947.pdf by guest on 21 November 2024

Figure 11.3
Marcantonio Raimondi, *The Judgment of Paris*, 1517–1520; detail

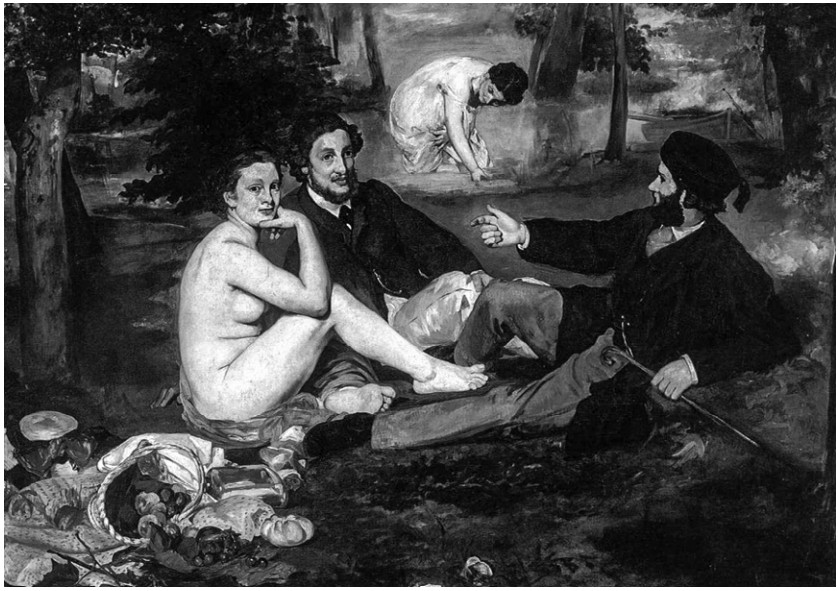


Figure 11.4
Édouard Manet, *Le déjeuner sur l'herbe*, 1863

Downloaded from http://direct.mit.edu/books/book-pdf/2437419/book_9780262356947.pdf by guest on 21 November 2024

Figure 11.5
Andy Warhol, *Campbell's Soup Cans*, 1962. © 2019 The Andy Warhol Foundation for the Visual Arts, Inc. / Licensed by Artists Rights Society (ARS), New York.

new pathway was forged: art as a concept, rather than as an object in its own right.

This trend began with Marcel Duchamp's entry titled *Fountain* in the 1917 Society of Independent Artists salon in New York City: an inverted urinal that he signed R. Mutt. The maker of the urinal was not an artist. He was a urinal maker. All Duchamp did was sign it and present it as an entry in an exhibition. What was astonishing was not the urinal, but its being included in an exhibition devoted to art.

Andy Warhol's *Soup Cans* was déjà Duchamp all over again. An art critic who wrote about how well the painting represented cans of soup would be missing the point. My guess is that Warhol's intent was to throw cold water on the pretentiousness of art that needs a companion theory to be understood. On the other hand, sometimes a can of soup is just a can of soup.

My goal up to this point has been to show that modernism was a movement that abandoned rules that had been used by artists for hundreds if not thousands of years.[7] These rules made use of dedicated neural architecture involving tonal centers, metrical and syllable structure, structural dependency, recursion, and face, place, and body recognition. Because the rules were based on these dedicated neural structures, I have referred

Downloaded from http://direct.mit.edu/books/book-pdf/2437419/book_9780262356947.pdf by guest on 21 November 2024

to them as natural in the same sense that we speak of natural language. I have assumed a natural aesthetic based on these natural rules.

This position is not especially novel. We have already heard from the first-century philosopher Apollonius of Tyana, who concluded that "[t]he mind of the beholder also has its share in the imitation" (Gombrich 1956, 181). Eric Kandel (2012, 393) adds his own sources:

> Our own response to art stems from an irrepressible urge to re-create in our own brains the creative process—cognitive, emotional, and empathic—through which the artist produced the work. On this point Gombrich, Kris, the Gestalt psychologist Vilayanur Ramachandran, and the art critic Robert Hughes all agree. This creative urge of the artist and the beholder presumably explains why essentially every group of human beings in every age and in every place throughout the world has created images, despite the fact that art is not a physical necessity for survival. *Art is an inherently pleasurable and instructive attempt by the artist and the beholder to communicate and share with each other the creative process that characterizes every human brain* [italics mine]—a process that leads to an Aha! moment, the sudden recognition that we have seen into another person's mind, and that allows us to see the truth underlying both the beauty and the ugliness depicted by the artist.

I've tried to shed light on how sharing between artist and audience works. I've suggested that the sharing mechanism consists of rules that exist in the minds of both parties just as natural language consists of rules shared by speakers and hearers. In other words, just like the relationship between speaker/writer and hearer/reader, the relationship between artist and audience is mediated by mental representation. As I mentioned at the end of chapter 10, if there is anything missing from the otherwise rich and insightful literature on aesthetics and the brain, it is, I think, the important—indeed, crucial—role that theories of mental representation play in the exchange.

Once the rules associated with the natural aesthetic were abandoned, artists were forced to find replacements for the simple reason that there can be no art without rules. Some were particularly successful. Pollock's "fractal expressionism" and Wallace Stevens's "The Snow Man" are notable examples, ironically so because they reestablished contact with dedicated mental architecture—in their case, recursion. This may well be true of other modernist artists.

It would be interesting to study in some detail the ways in which artists from Manet onward began to move away from—that is, abandon—the natural aesthetic. Such a study is beyond the scope of this book. But it

Downloaded from http://direct.mit.edu/books/book-pdf/2437419/book_9780262356947.pdf by guest on 21 November 2024

would be useful to see how that process might have developed. Perhaps the best example of artists reaching beyond the natural endowment are Georges Braque and Pablo Picasso, the founders of cubism.[8] Robert Rosenblum (2001, 13) describes their innovation in this fashion:

> From our position in the second half of the twentieth century, Cubism emerges clearly as one of the major transformations in Western art. As revolutionary as the discoveries of Einstein or Freud, the discoveries of Cubism controverted principles that had prevailed for centuries. For the traditional distinction between solid form and the space around it, Cubism substituted a radically new fusion of mass and void. In place of earlier perspective systems that determine the precise location of discrete objects and illusory depth, Cubism offered an unstable structure of dismembered planes and indeterminate spatial positions. Instead of assuming that the work of art was an illusion of a reality that lay beyond that, Cubism proposed that the work of art was itself a reality that represented the very process by which nature is transformed into art.

Braque and Picasso produced two representative masterpieces in 1910. As was often true of them in their cubist period, their subject was the same: in this case, a girl/woman holding a mandolin (see figures 11.6, 11.7).

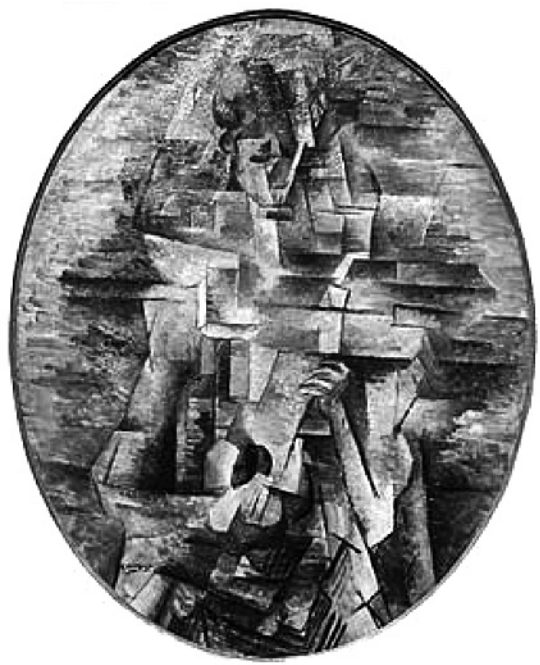


Figure 11.6
Georges Braque, *Woman with a Mandolin*, 1910

Downloaded from http://direct.mit.edu/books/book-pdf/2437419/book_9780262356947.pdf by guest on 21 November 2024

Figure 11.7
Pablo Picasso, *Girl with a Mandolin*, 1910

In both paintings, it is obvious that we are looking at a human figure. Face and body stand out, more so in the Picasso. As Rosenblum (2001, 43–44) notes:

> Picasso somehow preserves much of the physical and emotional integrity of his model. Her feminine form, with its rounded patterns of breasts and coiffure echoing the arc of the mandolin, is by no means obscured totally in the Cubist network of planes; and there even emerges something of a quiet, introspective melancholy (not unlike that of the Circus period) from a style that has so often been narrow-mindedly interpreted as coldly antagonistic to so-called "humanistic" values.

Picasso's painting offers a good example of Rosenblum's "indeterminate spatial positions" at work. In the detail in figure 11.8, you can see a cube next to the cylindrical shape of the arm. It is a Necker cube like the one in William Hogarth's *The Orgy* in chapter 8. Depending upon the way one views the cube, the arm next to it changes position. It is either in front of it or next to it.

Downloaded from http://direct.mit.edu/books/book-pdf/2437419/book_9780262356947.pdf by guest on 21 November 2024

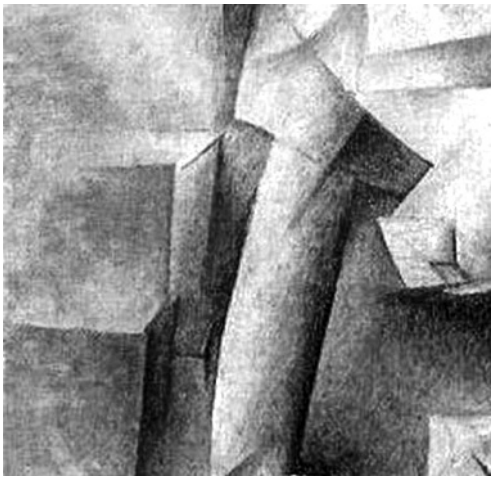


Figure 11.8
Pablo Picasso, *Girl with a Mandolin*, 1910; detail

Equally important, however, is the prominence of the figures. Whatever cues the fusiform gyrus and the extrastriate body area need to categorize an input as a figure are clearly present in both paintings. In this respect, Braque and Picasso are just like mimetic painters in that they both isolate cues that are critical to face and body recognition. They are following rules just as their predecessors did.

The next year, 1911, Braque and Picasso painted two more musicians, the former *Man with a Guitar*, the latter *The Accordionist* (see figures 11.9, 11.10). Here, affinity with face and body have all but disappeared, even more so in Picasso's painting than in Braque's. There is a hint of a bare chest in the Braque, and an arm and a hand. Picasso's rendition is much less evident, the barest hint of fingers and keys in the lower right center. You might just eke out a seated guitar player in the Braque, but you would have to be incredibly imaginative to see an accordion in the Picasso, let alone a player.

There are four major cubist painters: Georges Braque, Pablo Picasso, Juan Gris, and Fernand Léger. Their work (and that of their "Parisian satellites") ranges from images that cater to the designated categories of the brain to images that leave those categories behind. Rosenblum (2001, 135) makes the same point in different terms:

Downloaded from http://direct.mit.edu/books/book-pdf/2437419/book_9780262356947.pdf by guest on 21 November 2024

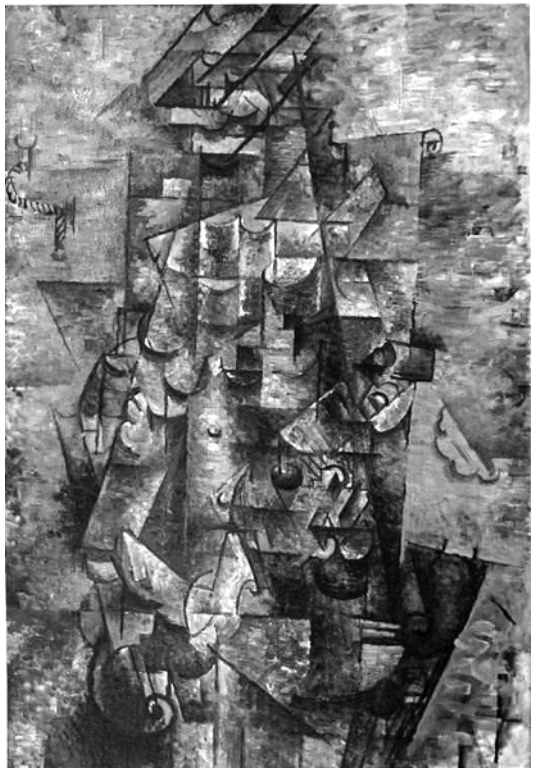


Figure 11.9
Georges Braque, *Man with a Guitar*, 1911

> But typically, Léger, unlike Braque and Picasso, retains his grasp of palpable matter [i.e., privileged categories]. However dismembered his forms may be, they never lose their physical substance or their ability to function in a physical way. If Analytic Cubism takes us to the mysterious core of the dialectic between art and reality, solid and void, line and plane, Léger's *Stairway* takes us rather to the center of a very corporeal universe whose shapes and movements are ultimately as intelligible as the inner workings of a machine.

It was only a matter of time before someone took us beyond "the mysterious core of the dialectic between art and reality, solid and void, line and plane."

Two years after *The Accordionist*, in 1913, the suprematist Kazimir Malevich exhibited *Black Square* (see figure 11.11). Rosenblum (2001, 246) describes the innovation in this fashion:

Downloaded from http://direct.mit.edu/books/book-pdf/2437419/book_9780262356947.pdf by guest on 21 November 2024

Figure 11.10
Pablo Picasso, *The Accordionist*, 1911

With the revolutionary zeal and idealism that prophesied the political revolution soon to come, Malevich proclaimed the new art of Suprematism, which denuded the still impure geometries of his Cubist work into perfect circles and squares and presented these absolutes as the virgin alphabet of a pictorial language that would never again be tainted by contact with any realities beyond itself.

For Malevich, the transition from Cubism to the Utopian purity of a nonobjective world was an abrupt jump that seemed more the product of a sudden intellectual revelation than of a sustained pictorial development. Even the structure of his Suprematist compositions, with their discrete, bounded shapes unambiguously located on top of a continuous, flat background, completely rejects the complexities of Cubist syntax.

Black Square is a picture of nothing at all. But that, of course, is the point.

A colleague of mine once observed that his rule of thumb for detecting a work of art was that if he could do it, then it wasn't art. That would

Downloaded from http://direct.mit.edu/books/book-pdf/2437419/book_9780262356947.pdf by guest on 21 November 2024

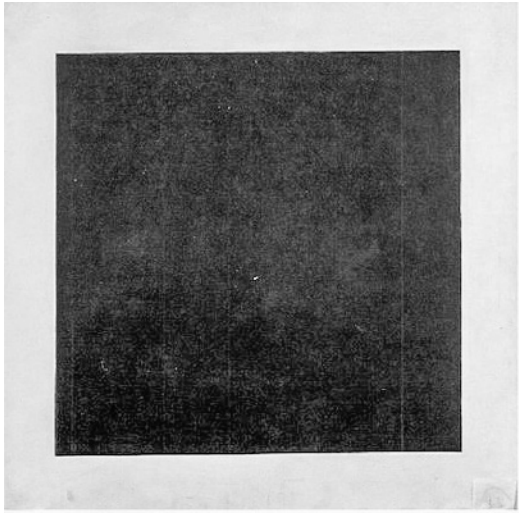


Figure 11.11
Kazimir Malevich, *Black Square*, 1913

rule out *Black Square*. (It is probably one of the world's easiest paintings to forge.) But everything depends on what the "it" means in "If I can do it, then it isn't art." In a handout accompanying the first exhibition of the painting, Malevich wrote:

> Up until now there were no attempts at painting as such, without any attribute of real life. … Painting was the aesthetic side of a thing, but never was original and an end in itself.

What we have here is not just a black square. It is also a statement: namely, that up until the time of the painting, art was about representing the real world. All of that changes with this, a painting of absolutely nothing "out there." The "it," then, refers not to the painting, but to the statement the painting is intended to make—in this instance, that art should be about itself and not about reality. Thus did Malevich's "statement" license the private format.[9]

Rosenblum and others have suggested that cubism represents a revolutionary shift away from the nature of reality (mimesis) toward the nature of art. At the heart of the revolution is the abandonment of the natural aesthetic, ultimately licensing the abstract work of masters like Piet Mondrian (1872–1944), Kazimir Malevich (1879–1935), Paul Klee

Downloaded from http://direct.mit.edu/books/book-pdf/2437419/book_9780262356947.pdf by guest on 21 November 2024

(1879–1940), Joan Miró (1893–1983), Franz Kline (1910–1962), and Pierre Soulages (1919–), to name just a few.[10] Although he certainly wouldn't have seen it in these terms, what Malevich was saying was that art needed to free itself from the tyranny of face, place, and body, the privileged categories of the brain.

In similar fashion, Arnold Schoenberg's atonal compositions, based as they were on arbitrary sets of notes, produced music that deliberately falls outside the boundaries of the natural inclinations of the brain, which in this instance could provide no "sorting out" help of the kind Andrea Moro (2016) talks about. This didn't mean that audiences couldn't appreciate Schoenberg's music. It meant that it would take them longer to do so, presumably because they were forced to resort to general-intelligence problem-solving to appreciate it, just as the participants in Moro's experiments, when confronted with an impossible language rule, were forced to resort to mental resources outside of those dedicated to natural language.[11]

Anjan Chatterjee (2014, 172ff.), who is a professor of neurology, offers interesting observations about the instinctual nature of the impulse to make art. That art might be instinctual is, after all, not out of the question since it appears to be universal. However, Chatterjee argues against that view. He sees the impulse to do art as arising from a variety of different cognitive sources and is at pains to explain how it might have come about from an evolutionary (Darwinian) perspective. In his chapter entitled "Art: A Tail or a Song?," he chooses the story of the Bengalese finch, an Asian bird descended from the feral white-rumped munia, to illustrate.

The finch, bred for its colorful plumage for 250 years and 500 generations, has undergone an interesting behavioral change. Its ancestors had a "stereotypic" mating call. However, as the bird was domesticated and as its colorful presentation blossomed, its stereotypic mating call began to vary and to increase in complexity. Chatterjee (2014, 176) attributes the shift to a loosening of genetic control:

> The difference between the munia and the finch's song, by analogy, is that of music played in the prescribed manner versus music that is improvised. As genetic control over brain function got looser, instinctual constraints on the bird's song got less specific. The finch's brain became more flexible and its behavior more improvisational and responsive to local environmental conditions.

Downloaded from http://direct.mit.edu/books/book-pdf/2437419/book_9780262356947.pdf by guest on 21 November 2024

Building on the perceived relationship between selective environmental pressure and birdsong, Chatterjee makes a leap to human behavior with a bold prediction (p. 177):

> Based on the dynamics of increased or relaxed selection pressures, I predict the following. Severely oppressive conditions that persist over long periods of time would prevent the emergence of art that is varied and looks creative to our modern eyes. … However, when the selection pressures of an oppressive regime relax, during periods of revolution, creative and varied art will seep out.

Modernism strikes me as an informative counterexample.[12] Modernism's innovations certainly produced art that is both varied and creative, art that looks so to our eyes and sounds so to our ears. But when one looks at the social environment in which modernism unfolded, there is no great swing from the repressiveness of a society like North Korea's (to use Chatterjee's example) to a more open society like that of modern France.

The Bengalese finch example skirts the creative aspect of human nature instantiated in our ability to speak. Whereas the Bengalese finch's song is limited and only breaks out in response to certain stimuli, language—as Descartes realized and as Chomsky (e.g., 2009) and others have pointed out—is both unbounded in scope and stimulus-free. By extension, the creativity that characterizes the sister arts discussed in this book is also unbounded and stimulus-free. Like natural language, the arts are rule-based. And, as I have suggested, the changes observed in these art forms are not the result of hidden selectional pressures. They are the result of conscious changes in the system of rules.

This is an important difference. As James McGilvray (2009, 119n7) observes:

> Chomsky often now refers to formal work on morphogenesis by Alan Turing and D'Arcy Thompson, and has suggested—speculatively at this stage—that perhaps language 'evolved' as a consequence of what happens to physical and biological processes when placed in a specific and complex form of organism. This is not evolution as popularly conceived, where it is supposed that evolution amounts to some kind of natural selection that yields reproductive advantages. This usual conception of evolution is generally assumed to require many millennia in order to produce a complex system.

The changes in the sister arts are not Darwinian in that they do not represent alterations brought about by selectional pressures. Quite the contrary: they are volitional, the outcome of creative acts on the part of the

Downloaded from http://direct.mit.edu/books/book-pdf/2437419/book_9780262356947.pdf by guest on 21 November 2024

artists. Whatever social pressures led artists to abandon one set of rules for another—a need to break free of the same ol', same ol', a Monty Pythonesque "now for something completely different"—whatever it may have been, they knew what they were doing and they chose to do it. Their collective act of abandoning the rules had an unexpected side effect: the need to come up with new rules. That the new rules would be, for the most part, unshared did not seem to be a matter of great concern. Chatterjee entitles his chapter "Art: A Tail or a Song?". My version of Chatterjee's chapter would be entitled "Art: New Rules for Old."

In Chatterjee's title, the tail refers to the peacock's tail, an elaborate genetic response presumably to enhance the peacock's prospects for attracting a mate. The Bengalese finch's varied song, on the other hand, is presumably a response to lessening selectional pressures brought about by domestication.[13] Chatterjee wants to extend this model to human art. I hope to have shown that it is more explanatory to view art, like language, as a rule-based phenomenon and that changes in the sister arts are the result of changes in an internal rule system.

It would be possible to end my narrative here. But the story really isn't at an end yet. If you are willing to hold in critical suspension the assertion that modernism constituted an abandonment of rules that formed a natural aesthetic for the creators and consumers of the sister arts, then the reaction to modernism—that is to say, artists going off in a myriad of different directions in search of new rules—tells us something important about ourselves.

Downloaded from http://direct.mit.edu/books/book-pdf/2437419/book_9780262356947.pdf by guest on 21 November 2024

12

What Does It Mean?

In the opening chapter, I suggested that modernism was not all that modern. I claimed that it shared a crucial property with the Newtonian revolution of the seventeenth century, a property that unites the two events under a single rubric: the brain coming up against its own limitations and the consequent need for coping strategies, that is, for workarounds. Intelligible scientific theorizing was one of those strategies. The new art forms of modernist practitioners were another. To understand what this means, we need to go back in the history of science to the seventeenth century.

In his foreword to Noam Chomsky's *What Kind of Creatures Are We?*, Akeel Bilgrami (2015, xvi) speaks of a "crux moment" in the history of science when

> Newton overturned the contact-mechanical assumptions of the early modern science that preceded him and posited a notion of gravity that undermined the earlier notions of matter, motion, and causality, which were scientific consolidations of our commonsense understanding (presumably determined by the cognitive limits of our biology) of the world of objects.

In Bilgrami's terms, this book argues that there are two "crux" moments in Western intellectual history, Newtonianism and modernism—or, more accurately, one crux moment that spanned 250 years, the blink of an eye from the perspective of humankind's 70,000 years on earth. They were two sides of the same coin. Both were responses to our relinquishing the hold that a "commonsense understanding … of the world of objects" had on the way we practiced science and art.[1]

The "mechanical philosophy" of the Galilean revolution is insightfully described by Jessica Riskin (2016, 54–55):

> Descartes's revolution in method … meant changing how people went about understanding and explaining natural phenomena.

Downloaded from http://direct.mit.edu/books/book-pdf/2437419/book_9780262356947.pdf by guest on 21 November 2024

> This methodological or *epistemological* revolution, by which I mean a revolution in how people thought they should go about understanding the world, brought with it a profound *ontological* revolution, by which I mean a revolution in what people thought the world essentially *was*: in the eyes of Descartes's followers, all the world (except human, rational thought) became just moving bits of uniform matter. But establishing that the world was made of moving bits of uniform matter was not Descartes's primary purpose. Rather, he was committed to *understanding* the world in mechanist terms. Machinery, in Descartes's usage, meant intelligibility.
>
> Descartes frequently characterized his method by saying he considered all things in the physical world as machinery: a philosopher's view of the physical world was precisely an artisan's view of a machine.

The profusion of machines in the seventeenth century reflected this *Weltanschauung*.[2] Newton put an end to it. The possibility that two objects could influence one another without touching was unthinkable in a world where reality was made of "moving bits of uniform matter" operating mechanically. In such a world, gravity was a mystery. You couldn't see, feel, touch, or smell it. It didn't move. It was invisible.

Here is how Newton saw his inexplicable explanation in the "General Scholium" of *Principia* (as quoted in Weinberg 2015, 243–244):

> Thus far I have explained the phenomena of the heavens and of our sea by the force of gravity, but I have not yet assigned a cause to gravity. Indeed, this force arises from some cause that penetrates as far as the centers of the Sun and planets without any diminution of its power to act, and that acts not in proportion to the quantity of the surfaces of the particles on which it acts (as mechanical causes are wont to do), but in proportion to the quantity of solid matter, and whose action is extended everywhere to immense distances, always decreasing as the inverse squares of the distances. … I have not as yet been able to deduce from phenomena the reasons for these properties of gravity, and I do not "feign" hypotheses.

Over 2,000 years before Newton, Hippocrates understood the need to go beyond our commonsense intuitions about the world to make sense of it. In a remarkably prescient passage, he wrote (see Marshall 1989, 302):

> Men do not understand how to observe the invisible by means of the visible. Their techniques resemble the physiological processes of man, but men do not know this. … Though men understand the technical processes, they failed to understand the natural processes imitated by the techniques.

The physicist Jean Baptiste Perrin echoed Hippocrates in his Nobel Prize acceptance speech when he defined the goal of science as explaining

Downloaded from http://direct.mit.edu/books/book-pdf/2437419/book_9780262356947.pdf by guest on 21 November 2024

complex visibles in terms of simple invisibles. The fact that it took 2,000 years to break the back of our built-in empirical bias shows just how strong the "doing-what-comes-naturally" pull is. It was so strong, in fact, that Newton himself thought of gravity as "an absurdity," something that was inconceivable but necessary. Many modern physicists share a similar puzzlement when it comes to quantum mechanics, as we shall see.

In the face of this conundrum, Newton simply subsumed this "occult force" into a new scientific worldview. Then he spent the rest of his life trying to do away with it. Of course, he failed. He was right. Nor did subsequent centuries of scientific inquiry greet this change with open arms. Forced to give up on intelligible worlds, natural philosophers (i.e., scientists) quietly went about "lowering their sights" to the business of proposing intelligible theories.

Noam Chomsky (personal communication) describes the gradual shift to the new science:

> The English term "science" in the modern sense only came along in mid-19th century, with Whewell. Before that it was just natural philosophy (as I guess it still is in Oxbridge). Before that, an educated gentleman—even sometimes a self-educated artisan—could comprehend most of science. Not long after one couldn't even comprehend closely related branches of science. Not just that it was becoming more complex and diversified. Also that it was departing farther from the common core of our understanding. It was becoming the domain of people who were often at the fringes of human cognitive capacity, like chess masters, or pole vaulters (or great trombone players).[3] And it was departing more from intelligibility, in the sense of intelligibility demanded by early modern science from Galileo through Newton.

Just as Newton's monumental innovation 200 years earlier had upended the prevailing mindset on how science was done, by the mid-nineteenth century the sister arts had begun to react to their own limitations. The similarity between the two modes of thought is striking. The Galilean worldview was based on a natural or intuitive sense of how the world worked. Newton exposed the limitations of this "commonsense understanding."

Just so, each of the sister art forms was also "natural" or intuitive in that each used rules natural to human cognition. As already noted, these rules functioned in much the same way that rules of grammar function to connect a speaker and a listener. The practitioners of the sister arts, like their post-seventeenth-century scientific counterparts, also put their naturally imposed constraints aside.

Downloaded from http://direct.mit.edu/books/book-pdf/2437419/book_9780262356947.pdf by guest on 21 November 2024

In his account of the shift from neo-scholastic to post-Newtonian science, Chomsky advances the notion that the great founders of modern science first adopted the "mechanical philosophy" because "it conforms to our intuitive reflective understanding of how things happen in the world" (see appendix B).

In parallel fashion, we can say that the great artists of the premodern movements in poetry, music, and painting used rules that conformed to their commonsense and intuitive understanding of what it was they did naturally—that is, see the world representationally, hear music tonally, and write poetry based on systematic repetition using linguistic givens like stress and syllable structure—to describe in perfectly accessible terms the commonsense world in which they lived.[4]

With respect to science, we know the reason for change. Commonsense science was incapable of explaining observed phenomena like the motions of the planets. Science, thanks to Galileo and his cohort, began to seek for explanation. That journey led them beyond anything they could have imagined. But if "mechanical philosophy" was jettisoned in the face of Newton's monumental insight, what forced the sea change that goes under the name of modernism? That is, what caused artists to abandon "commonsense" art?

I think the answer is contained in a conversation that transpired between Noam Chomsky and Benjamin Boretz, a composer and music theorist, now emeritus professor at Bard College.

Chomsky once asked Boretz, "Why don't you compose Beethoven's Tenth Symphony?"

Boretz replied, "Because it's too easy."[5]

This is what caused the sister arts to move away from the natural aesthetic. Influential artists came to believe that the natural aesthetic had run its course or, as Lerdahl puts it with respect to music, composers were overcome by "the exhaustion of tonality."

While Gustav Mahler was pushing hard against the boundaries of tonality, Charles Baudelaire and Ezra Pound were pushing at the boundaries of metricality, and mid-nineteenth-century painters like Édouard Manet, Vincent van Gogh, and Paul Gauguin were doing the same with respect to Vasarian mimesis.[6] All of them wanted something more, something new, something original, something unique. Who can blame them?

Downloaded from http://direct.mit.edu/books/book-pdf/2437419/book_9780262356947.pdf by guest on 21 November 2024

There may be causes other than psychic dissatisfaction, I suppose. Turning to cultural explanations, one might plausibly argue that the French Revolution and its challenge to the normal order of things nudged the sister arts toward revolution in a kind of domino theory of cultural change. The idea is that the challenge to a naturally understandable world of the seventeenth century gave rise to a challenge to the so-called "natural order of things," the French Revolution being one consequence and the abandonment of the natural aesthetic another.

Throughout the course of the Enlightenment and on into the nineteenth century, this challenge persisted. As a result, society came to be viewed as a consequence of human activity rather than of divine edict. This is what led to a reconsideration of the role of the arts in society. Art became a subject of reflection and then theorizing. This shift would naturally cause a widening gap between popular art, on the one hand, and high art, on the other.

This is certainly a plausible scenario.[7] In fact, the shift might be a combination of the challenge to the natural order coupled with exhaustion of the natural aesthetic, as well as other factors. For example, again from personal communication, Chomsky speculates:

> So maybe the exhaustion of normal cognitive capacities is much broader: science, the arts, every domain that humans had pressed to the limits of ordinary understanding once economic surplus reached the point that at least some groups of humans could be freed from labor to survive and explore the limits of human cognitive capacity—reaching limits at roughly the same time, and then going beyond in exotic ways no longer comprehensible to those not introduced into the arcane genres created.

In other words, a broad spectrum of changes might well have occurred after the seventeenth century affecting a wide variety of human activities because history conspired to produce a class of people lucky enough to have world enough and time to challenge conventional wisdom, not only in science and the arts, but also in politics, economics, technology, statecraft, and the law.

At this juncture, I am not so much interested in what caused the tectonic shift called modernism as I am in its nature as a cognitive phenomenon and the significance of that nature for the sister arts. When the constraints imposed by the natural aesthetic were dropped, artists were forced to explore new and exotic territories just as the sciences did. And just as abandonment of commonsense principles in science led

Downloaded from http://direct.mit.edu/books/book-pdf/2437419/book_9780262356947.pdf by guest on 21 November 2024

to inaccessibility for all except those with the time, money, and inclination to devote themselves to the new disciplines, so too did abandonment of the natural aesthetic in the sister arts lead to inaccessibility—in most cases, an unwanted side effect for their audiences, who had to learn the new rules if they wanted to continue to enjoy the pleasure that art provided.

I noted earlier that there is a correlation between metrical poetry and accessible content. Think of such poems as Thomas Gray's "Elegy Written in a Country Churchyard":

> The curfew tolls the knell of parting day,
> The lowing herd wind slowly o'er the lea,
> The plowman homeward plods his weary way,
> And leaves the world to darkness and to me.

compared with the opening of Jorie Graham's "San Sepolcro":

> In this blue light
> I can take you there,
> snow having made me
> a world of bone
> seen through to.

or of John Ashbery's "A Disservice":

> Life with its sorrow, life with its tear.
> And you know what that means:
> the sky in a drawer,
> the underwear underworld
> on the floor of the moon.

What Gray is writing about is crystal clear, even on first reading. The aesthetic appeal of the verse is not what he is saying, but how he is saying it. With respect to the other two, one hasn't a clue on first reading, or second or third.

When poets abandoned shared metrical rules, they also abandoned shared content—that is, church bells signaling curfews, cows wandering over a meadow, farmers returning home at the end of the day. The shift is parallel to what happened in painting. Representation of the external world was abandoned. The source of content changed radically. It did not take long for painting to metamorphose into heretofore unimaginable art forms that, in the eyes of some, were "freakish distortions of shape and color and … abstract grids, shapes, dribbles, splashes, and, in the $200,000 painting featured in the recent comedy *Art*, a blank white

Downloaded from http://direct.mit.edu/books/book-pdf/2437419/book_9780262356947.pdf by guest on 21 November 2024

canvas" (Pinker 2002, 409–410). This shift in accessibility is redolent of the shift that occurred when neo-scholastic explanations of natural phenomena were, thanks to Galileo and his cohort, abandoned. But there the parallel ends. Science resorted to intelligible theory making. But what did poetry and painting do?

If you abandon the external world as your source for subject matter, that leaves no place to go but inward—that is, to the mental life inside your head. That's what's going on in Graham's poetry and in Ashbery's. My mother used to say to me, "Tell me what's on your mind, I can't see inside your head." That remark has been echoed by countless puzzled readers of the "poetry of indeterminacy." By the same token, when painting gave up on mimesis, the result was the fractured impact of 500 manifestos.[8] The painting scene was like a car window struck by a stone. Each manifesto was a neologism that one needed a dictionary to understand.[9]

In chapter 2, I discussed fMRI data showing that "impossible" language rules conjured up by Andrea Moro and his colleagues were processed somewhere other than in the language centers of the brain. I suggested that these experiments offer a model of what I think happened at the dawn of modernism. Art forms based on cognitive structures that correspond to our intuitive perception of the world were replaced by "impossible" art forms that require mental activity elsewhere than in the neural areas dedicated to these natural structures. Sometimes these formats exploited other privileged categories (Jackson Pollock and fractals, Wallace Stevens and recursion), sometimes not (Arnold Schoenberg and the Eschbeg set).

With the sister arts turning inward to private formats, the academic disciplines of exegesis were born. Now to understand John Ashbery's poetry, for example, one needs a mentor like Dante's Virgil, just as one needs a mentor to plumb the depths of calculus, a branch of mathematics invented by Newton (and independently by Leibniz) to describe the motions of the planets.

Because of the nature of the two enterprises, science and the sister arts followed different paths. The scientific method kept scientific inquiry within the bounds of testable hypotheses even though the ground had shifted from science shackled by natural cognitive limits to science enabled by intelligible theories.

Downloaded from http://direct.mit.edu/books/book-pdf/2437419/book_9780262356947.pdf by guest on 21 November 2024

No such method enabled the arts. Ironically, once the ball started rolling, the accessibility of the natural aesthetic helped facilitate the sea change. Metrical rules, rules of tonal music, and a preference for privileged categories of the visual system are all accessible brain functions. Users of those systems, both artist and audience, have the option of consciously abandoning them.[10] And abandon them they did.[11]

When the natural rule sets that had been in place for so long were jettisoned, the sister arts moved into unexplored territories where the replacement sets were in many cases learnable but not natural—for example, atonal music. Left to their own devices, artists resorted to private formats such as we have seen in Machaut and Chaucer. That move led to the extraordinary explosion of formats, 500 in painting alone.

The thesis of this book is that the "exhaustion of normal cognitive capacities" that occurred in the seventeenth century is nothing more nor less than the same exhaustion that occurred in the twentieth century and goes by the name of modernism. In fact, if one considers that *Homo sapiens* as a symbol-manipulating creature is roughly 70,000 years old, then the exhaustion occasioned by the shift in the scientific worldview of the seventeenth century and the shift in the character of the sister arts in the twentieth century are the same phenomenon. From that long-range point of view, *Homo sapiens* reached exhaustion of normal cognition in the arts and sciences at roughly the same time.

I have chosen psychological reasons for the abandonment of rules: boredom, restlessness, saturation, exhaustion. However, as discussed earlier, societal/cultural reasons might also lie behind the shift and, if one looks more broadly, one might see its effects in other areas of human activity, such as politics, economics, even religion.[12]

That is where we are now. The natural propensities of the brain, having reached exhaustion, were abandoned, both in the high arts and in science (and perhaps elsewhere). From that point on, human intellectual activity shifted toward the, for want of a better word, "exotic." This raises a question. If there were limits to commonsense approaches to human intellectual activity, will there be a limit to exotic approaches?

When it comes to limitations of our wetware (read "general intelligence"), some think the sky is the limit. For example, in a 1930 radio address to the Society of German Natural Scientists and Physicians, the great mathematician David Hilbert concluded (Smith 2014):

Downloaded from http://direct.mit.edu/books/book-pdf/2437419/book_9780262356947.pdf by guest on 21 November 2024

> We must not believe those, who today with philosophical bearing and a tone of superiority prophesy the downfall of culture and accept the *ignorabimus* [we will not know]. For us there is no *ignorabimus*, and in my opinion even none whatever in natural science. In place of the foolish *ignorabimus* let stand our slogan:
>
> We must know,
> We will know.

Those final words, in fact, are engraved in German on Hilbert's tombstone—surely one of the most optimistic statements in all of tombstone literature.[13]

What it comes down to is this. Frogs will never understand quantum mechanics because they simply don't have the biological wherewithal. Now the question is: Are there phenomena in the universe that are to us what quantum mechanics is to frogs? I suppose the question is arguable.

For Thomas Hobbes, the answer was undoubtedly yes. Riskin (2016, 73) quotes him as saying:

> "No man can have in his mind an image of infinite magnitude; nor conceive of infinite swiftness, infinite time, infinite force, or infinite power." How could a finite material object, the brain, possibly contain an infinite magnitude of any kind? Therefore, when we say we conceive of something as infinite, we simply mean we cannot conceive of its limits.

A more modern and profound version of this argument can be found in a rumination by the British cosmologist and astrophysicist Martin Rees (2017):

> My claim that there are limits to human understanding has been challenged by David Deutsch, a distinguished theoretical physicist who pioneered the concept of "quantum computing." In his provocative and excellent book *The Beginning of Infinity* (2011), he says that any process is computable, in principle. That's true. However, being able to *compute* something is not the same as having an insightful *comprehension* of it. The beautiful fractal pattern known as the Mandelbrot set is described by an algorithm that can be written in a few lines. Its shape can be plotted even by a modest-powered computer. But no human who was just given the algorithm can visualize this immensely complicated pattern in the same sense that they can visualize a square or a circle.

Rees's general point is that there are limits to what our wetware will allow us to know:

> Albert Einstein said that the "most incomprehensible thing about the universe is that it *is* comprehensible." He was right to be astonished. Human brains evolved to be adaptable, but our underlying neural architecture has barely

Downloaded from http://direct.mit.edu/books/book-pdf/2437419/book_9780262356947.pdf by guest on 21 November 2024

> changed since our ancestors roamed the savannah and coped with the challenges that life on it presented. It's surely remarkable that these brains have allowed us to make sense of the quantum and the cosmos, notions far removed from the "commonsense," everyday world in which we evolved.
>
> But I think science will hit the buffers at some point. There are two reasons why this might happen. The optimistic one is that we clean up and codify certain areas (such as atomic physics) to the point that there's no more to say. A second, more worrying possibility is that we'll reach the limits of what our brains can grasp. There might be concepts, crucial to a full understanding of physical reality, that we aren't aware of, any more than a monkey comprehends Darwinism or meteorology. Some insights might have to await a post-human intelligence.

Physicist Stephen Weinberg (2015, 243), on the other hand, takes a wait-and-see attitude:

> This is a common theme in the history of physics. Newton's theory of gravitation made successful predictions for simple phenomena like planetary motion, but it could not give a quantitative account of more complicated phenomena, like the tides. We are in a similar position today with regard to the theory of the strong forces that hold quarks together inside the protons and neutrons inside the atomic nucleus, a theory known as quantum chromodynamics. … Here, as for Newton's theory of the tides, the proper attitude is patience. Physical theories are validated when they give us the ability to calculate enough things that are sufficiently simple to allow reliable calculations, even if we can't calculate everything that we might want to calculate.

Weinberg aligns himself with Hilbert and with Deutsch. We simply have to wait until someone comes along who will show physics the way to more precise calculation. Perhaps. But as Rees suggests (echoing Richard Feynman; see below), calculation is not comprehension. Have we come up against the limits of our own mental equipment?[14] Quantum mechanics may be our Waterloo.[15]

In his admirably accessible book, *Beyond Weird*, Philip Ball (2018) describes quantum mechanics without the mathematics. He begins (p. 13) with a quotation from Richard Feynman:

> We can't pretend to understand it since it affronts all our commonsense notions. The best we can do is to describe what happens in mathematics, in equations, and that's very difficult. What is even harder is trying to decide what the equations mean. That's the hardest thing of all.

Several hundred pages later (pp. 345–346), he concludes:

> The very triumph of quantum mechanics is in having reached the point at which we must leave behind any notion of 'physical realism': the assumption that scientific investigation gives us access to and knowledge of physical

Downloaded from http://direct.mit.edu/books/book-pdf/2437419/book_9780262356947.pdf by guest on 21 November 2024

> reality. … [T]he mystery is that our equations can continue into this realm beyond realism and even thrive there, though we can't then deduce (or express) their meaning. … Language is the only vehicle we have for constructing and conveying meaning: for talking about our universe. Relationships between numbers are no substitute.

And then he adds this comment from one of the movers and shakers of contemporary quantum theory, John Bell (1990, 33):

> Suppose that when formulation beyond 'for all practical purposes' is attempted, we find an immovable finger obstinately pointing outside the subject, to the mind of the observer, to the Hindu scriptures, to God, or even only Gravitation? Would that not be very, very interesting?

That is such a nice way of contemplating whether or not we have reached the limits of our exoticism. I agree with Bell. Knowing the answer would indeed be very, very interesting.

The idea of cognitive limits is not a new one. Colin McGinn (1993) discusses it in connection with long-standing philosophical problems of consciousness, the self, meaning, free will, knowledge, reason, truth, and philosophy itself. He considers the possibility that, unlike most scientific problems, these "philosophical" conundrums have been intractable for so long because we simply don't have the mental equipment to deal with them (p. 11):

> Natural science is a product of the human mind, with its inbuilt principles and limits, and there is no good reason to believe that every question about nature can be answered by a mind so structured and employed. Philosophy, in particular, might require styles and thought and methods of enquiry that lie outside the bounds of our capacity for empirical science. And, of course, on the face of it philosophical problems are not soluble by scientific methods.

He explains his position in these words (pp. 2–3):

> [P]hilosophical perplexities arise in us because of definite inherent limitations on our epistemic faculties, not because philosophical questions concern entities or facts that are intrinsically problematic or peculiar or dubious. Philosophy is an attempt to get outside the constitutive structure of our minds. Reality itself is everywhere flatly natural, but because of our cognitive limits we are unable to make good on this general ontological principle. Our epistemic architecture obstructs knowledge of the real nature of the object world. I shall call this thesis *transcendental naturalism*.

Later (pp. 36–37), he notes:

> [A] remarkable passage from the 19th-century scientist John Tyndall … succinctly expresses the spirit of the [transcendental naturalism] position: 'The

Downloaded from http://direct.mit.edu/books/book-pdf/2437419/book_9780262356947.pdf by guest on 21 November 2024

> passage from the physics of the brain to the corresponding facts of consciousness is unthinkable. Granted that a definite thought and a definite molecular action in the brain occur simultaneously, we do not possess the intellectual organ, nor apparently any movement of the organ, which would enable us to pass, by a process of reasoning, from one to the other'. This gets it exactly right by my lights, even down to the suggestion of an explanation of the unthinkability in terms of mental modularity. My general thesis, in these terms, is that philosophical bafflement results from the lack of an 'intellectual organ' suitable to the subject.

In other words, our brain is well-suited to certain kinds of problems and not others. Scientific problems appear to be our long suit. The meaning of quantum mechanics may well be a puzzle that will be solved. The meaning of consciousness may well remain a mystery forever simply because we don't have the mental wherewithal to solve it.

Let us take stock. Science will never go back. Far too much has been gained in our understanding of how things work outside of ourselves. As for the arts, there is no need to worry about backsliding. The natural aesthetic never went away. Quite the contrary: it thrives in rock, jazz (pace the free-form variety), graphic novels, the comics, mainstream movies, television, plays, dance, the advertising industry, and painting. Even that most characteristic exemplar of cubism, Picasso's *Girl before a Mirror*, looking past Sargent's *Madame X* on Russell Connor's *New Yorker* cover, elicits a response from the fusiform gyrus and the extrastriate body area. The natural aesthetic will always be with us because, after all, we are who we are.

The struggle of the high arts to maintain an audience, however, will go on. It is very hard to find a substitute for the natural aesthetic. There is no better illustration of this than the observation that the original abandoners of the natural aesthetic—Eliot, Yeats, and Pound in poetry, Schoenberg, Berg, and Webern in music, and Manet, Van Gogh, Cézanne, Matisse, and Gauguin in painting—were themselves practitioners of extraordinary talent.

This is not surprising. Departing from the natural aesthetic demanded deep-pocketed talent. These artists' chosen forms had provided them with prepaid support in the currency of shared predispositions. Once those were put aside, if there was to be any kind of reciprocity between an artist and his or her audience, new support had to be found to replace the familiar kind. But because that was hard to do, only practitioners with exceptional talent were able to do it convincingly. That is why there is

Downloaded from http://direct.mit.edu/books/book-pdf/2437419/book_9780262356947.pdf by guest on 21 November 2024

such a difference between the very best in their respective fields and their followers. It took artists of uncommon talent to break successfully with the natural past. Subsequent followers, inevitably less talented, greased the slippery slope of inaccessibility.

This is in sharp contrast to science. What keeps science on the straight and narrow is its method. It proceeds by a cycle of hypothesis, evidence in support of the hypothesis, and prediction—that is, claims made by the hypothesis that go beyond the evidence, what Michael Polanyi called the predictive power of the scientific method.

Gravitational waves are a perfect example. First proposed by Henri Poincaré in 1905 and predicted by Albert Einstein in 1916 on the basis of general relativity, they were actually detected 100 years later by Rainer Weiss of MIT and his colleagues at the Laser Interferometer Gravitational-Wave Observatory (LIGO). These researchers have ushered in a new era in science comparable, in my opinion, to the Galilean revolution.

The success of the LIGO experiment added a new dimension to the tools science uses to explore the universe. Prior to LIGO, all our celestial explorations were optic in nature. LIGO has added another dimension, the ear. Aural probes may well turn out to be precisely what is needed to explain why our theories to date account for only 2% to 3% of the matter in the universe. Perhaps we will be able to hear the rest of the universe. LIGO may well have given new meaning to Pythagoras's music of the spheres.

What is the scientific method's counterpart for the arts? There isn't one. Once upon a time, the natural aesthetic performed this role. But there was a difference. Science could not abandon its method without committing intellectual suicide. But the sister arts could abandon what constrained them. They traded natural rules for Easter eggs. And what one might have expected actually happened. Art became an exotic ballgame.

This trajectory applied only to the high arts. And, indeed, not always. Some of the greatest music of the twentieth century is tonal. And, by dint of exposure and work on the part of audiences, some of the most-enjoyed music of the twentieth century is atonal. Still, it is a rare symphony orchestra's program that focuses on the latter to the exclusion of the former. An orchestra would do so at its peril. Old chestnuts are there for a reason.

As I said earlier, it is very hard to find a substitute for the natural aesthetic.

Downloaded from http://direct.mit.edu/books/book-pdf/2437419/book_9780262356947.pdf by guest on 21 November 2024

Downloaded from http://direct.mit.edu/books/book-pdf/2437419/book_9780262356947.pdf by guest on 21 November 2024

Appendix A: From Igor Stravinsky, *The Poetics of Music in the Form of Six Lessons*

The more art is controlled, limited, worked over, the more it is free.

As for myself, I experience a sort of terror when, at the moment of setting to work and finding myself before the infinitude of possibilities that present themselves, I have the feeling that everything is permissible to me. If everything is permissible to me, the best and the worst; if nothing offers me any resistance, then any effort is inconceivable, and I cannot use anything as a basis, and consequently every undertaking becomes futile.

Will I then have to lose myself in this abyss of freedom? To what shall I cling in order to escape the dizziness that seizes me before the virtuality of this infinitude? However, I shall not succumb. I shall overcome my terror and shall be reassured by the thought that I have the seven notes of the scale and its chromatic intervals at my disposal, that strong and weak accents are within my reach, and that in all of these I possess solid and concrete elements which offer me a field of experience just as vast as the upsetting and dizzy infinitude that had just frightened me. It is into this field that I shall sink my roots, fully convinced that combinations which have at their disposal twelve sounds in each octave and all possible rhythmic varieties promise me riches that all the activity of human genius will never exhaust.

What delivers me from the anguish into which an unrestricted freedom plunges me is the fact that I am always able to turn immediately to the concrete things that are here in question. I have no use for a theoretic freedom. Let me have something finite, definite—matter that can lend itself to my operation only insofar as it is commensurate with my possibilities. And such matter presents itself to me together with its limitations. I must in turn impose mine upon it. So here we are, whether we like it

Downloaded from http://direct.mit.edu/books/book-pdf/2437419/book_9780262356947.pdf by guest on 21 November 2024

or not, in the realm of necessity. And yet which of us has ever heard talk of art as other than a realm of freedom? This sort of heresy is uniformly widespread because it is imagined that art is outside the bounds of ordinary activity. Well, in art as in everything else, one can build only upon a resisting foundation: whatever constantly gives way to pressure constantly renders movement impossible.

My freedom thus consists in my moving about within the narrow frame that I have assigned myself for each one of my undertakings.

I shall go even farther: my freedom will be so much the greater and more meaningful the more narrowly I limit my field of action and the more I surround myself with obstacles. Whatever diminishes constraint diminishes strength. The more constraints one imposes, the more one frees one's self of the chains that shackle the spirit.

To the voice that commands me to create I first respond with fright; then I reassure myself by taking up as weapons those things participating in creation but as yet outside of it; and the arbitrariness of the constraint serves only to obtain precision of execution.

From all this we shall conclude the necessity of dogmatizing on pain of missing our goal. If these words annoy us and seem harsh, we can abstain from pronouncing them. For all that, they nonetheless contain the secret of salvation.

Downloaded from http://direct.mit.edu/books/book-pdf/2437419/book_9780262356947.pdf by guest on 21 November 2024

Appendix B: Noam Chomsky, Personal Communication, October 19, 2017

We can trace the origins of modern science back to the time when Galileo and his contemporaries dismissed the picture of the world that prevailed in neoscholastic accounts: rocks fall and steam rises because they are going to their natural place, objects attract and repel each other because of sympathies and antipathies, visual perception involves forms flitting through the air, etc. The new scientists were willing to be puzzled by the phenomena of nature. They refused to be satisfied with vacuous pseudo-explanations, and demanded instead some coherent account that could qualify as genuine explanation. To do so, they developed the "mechanical philosophy": the world is a machine, a more complex and intricate version of the remarkable devices then proliferating in Europe that performed complex and entertaining actions. A true explanation would have to be in mechanical terms, in terms of gears and levers, pushing, pulling and rotating, etc.

It can plausibly be maintained that the great founders of modern science adopted this framework because it conforms to our intuitive reflective understanding of how things happen in the world.

Working in this tradition, Descartes developed a sketch of how, he believed, almost everything could be explained in mechanical terms: all of the inorganic world, the non-human organic world, and human sensation and perception, along with much of human action. But he recognized that some aspects of human capacity and behavior fall beyond these bounds. A prime example, for Descartes, was what has sometimes been called "the creative aspect of language use": the capacity, shared by all humans, to produce and understand an unbounded number of expressions, and to use them in ways that are appropriate to situations but not caused by them—"incited and inclined" but not "compelled," in Cartesian terms.

Downloaded from http://direct.mit.edu/books/book-pdf/2437419/book_9780262356947.pdf by guest on 21 November 2024

As a good scientist, he therefore postulated a second principle alongside the mechanical principle that works for the rest of the world: in his metaphysics, a second substance, *res cogitans*. That is the classical mind-body problem, in Cartesian terms.

The great philosophers of the day—Leibniz, Huyghens, Newton, and others—accepted the mechanical philosophy as essentially correct, indeed obviously so. However, Newton, to his great dismay and disbelief, showed that even the inorganic world does not conform to the principles of the mechanical philosophy: the world is not a machine. Rather, attraction and repulsion operate without contact. Newton's great contemporaries regarded this conclusion as ridiculous, a reversion to the despised "occult properties" of the neoscholastics. Newton largely agreed. He regarded his great discoveries as an "absurdity" that no one with sound scientific ("philosophical") understanding could accept. He disagreed with his critics only in that his "occult properties" had mathematical formulations that provided genuine explanations, though he could not provide a physical basis for them.

All of this was understood at once by the leading thinkers of the day, Locke and Hume to take the most prominent examples. Both recognized that Newton, while revealing many of the mysteries of nature, had shown that the world is not intelligible to us, that it poses permanent mysteries for the human mind, that it has properties that cannot be grasped by our cognitive faculties.

They also understood that the mind-body problem had collapsed, since there are no bodies in the only intelligible sense of the concept that had been devised: no coherent notion of physical or material, beyond whatever there is. Quite reasonably then, Locke suggested that thought should be understood as some property of certain kinds of organized matter, ideas pursued through the 18th century, adopted by the early Darwin, then largely forgotten and revived in recent decades as a radically new idea in philosophy of mind.

Newton's theories were of course intelligible; it was the world that they described that was not. Over time, Newton's "absurdities" were simply absorbed into what became "scientific common sense." In effect, science lowered its aspirations: from showing that the world is intelligible, in accord with the mechanical philosophy (arguably, the conception provided by our innate cognitive faculties), to developing theories of the

Downloaded from http://direct.mit.edu/books/book-pdf/2437419/book_9780262356947.pdf by guest on 21 November 2024

world that are intelligible and genuinely explanatory, however exotic—however foreign to our cognitive nature—they may be. That is a critical change in the history of science.

We can therefore recognize three phases of the sciences: the neo-scholastic picture of common sense lacking genuine explanations; the mechanical philosophy of early modern science, from Galileo and his contemporaries through Newton (and partially beyond), seeking to show that the world is intelligible to us with genuine explanations but in vain, perhaps because the limits of human cognition preclude this goal as Locke and Hume recognized in their own terms; and the post-Newtonian era in which the sights of science are lowered, opening the way to remarkable discoveries but with the goals of the founders of modern science tacitly abandoned.

Downloaded from http://direct.mit.edu/books/book-pdf/2437419/book_9780262356947.pdf by guest on 21 November 2024

Downloaded from http://direct.mit.edu/books/book-pdf/2437419/book_9780262356947.pdf by guest on 21 November 2024

Notes

Chapter 1

1. For a discussion of the linking of these arts historically, see Gabrielle Starr's (2013) book, which is devoted to developing a model for "understanding the dynamic and changing features of aesthetic life, the relationships among the arts, and how individual differences in aesthetic judgment shape the varieties of aesthetic experience."

2. This is not to say that other art forms, such as architecture, dance, and plays, cannot be characterized by rule systems. It's just that if they are, I don't know about it.

3. See Pinker 2002, chap. 20, for a survey of the cultural and socioeconomic underpinnings of modernism and postmodernism.

4. Thus, John Hamre, Deputy Secretary of Defense from 1997 to 1999, was quoted as saying, "The Y2K problem is the electronic equivalent of the El Niño and there will be nasty surprises around the globe."

5. I don't see the force of this argument. Gustave Courbet, to name just one, would have been quite at home among Renaissance artists of whom Arnheim spoke, as witnessed by his *The Origin of the World*.

6. For a rather different explanation of *Le déjeuner sur l'herbe*, see the discussion surrounding figures 11.2–11.4.

7. A good summary of the variety of cultural factors that induced the shift toward modernism in painting can be found in Solso 1994, 220:

> One school of thought suggests that impressionist art emerged in reaction to the newly invented camera, which portrayed real scenes with startling fidelity. Painters could do no better, and developed instead a new style of art in which the principal effect is obtained through one's emotional reaction to a painting, rather than through one's sense of visual correctness. Other factors surely contributed as well, including the increasing personal freedom and wealth of the period, greater understanding of the interactive qualities of colors, and the invention of new products such as tin tubes that kept oil paints fresh for days and thereby allowed artists greater mobility. Many painted outside in natural settings. Then, there were the extraordinary artists and their personal outlook on life—not trifling factors.

Downloaded from http://direct.mit.edu/books/book-pdf/2437419/book_9780262356947.pdf by guest on 21 November 2024

8. Arthur Danto (1995), philosopher and longtime art critic for *The Nation*, appears to be allied with the Delaroche party in a comment acknowledging Giorgio Vasari (1511–1574). Vasari was an Italian architect, painter, and historian who is generally considered to be the father of art history, his 1550 *Le Vite de' più eccellenti pittori, scultori, ed architettori* (*Lives of the Most Eminent Painters, Sculptors, and Architects*) being the foundational document. He is credited with the view that the goal of painting is representational, hence the term *Vasarian mimesis*. Danto says:

> Vasari, construing art as representational, sees it getting better and better over time at the "conquest of visual appearance." That narrative ended for painting when moving pictures proved far better able to depict reality than painting could. (p. 125)

9. Igor Stravinsky (1947, 61) obviously agrees with this sentiment:

> Whether we admit it or not, the Wagnerian drama reveals continual bombast. Its brilliant improvisations inflate the symphony beyond all proportion and give it less real substance than the invention, at once modest and aristocratic, that blossoms forth on every page of Verdi.

10. Martindale provides a trenchant critique of a number of cultural and sociological theories. His own theory of aesthetic change is Darwinian in nature. It depends on a number of assumptions that I do not share, including the assumption that an artist has no audience. I will return to this topic later on.

11. For his part, Gombrich's final position with respect to the business of the cultural historian appears to be a rather relaxed one (1969, 54):

> Whether we know it or not, we always approach the past with some preconceived ideas, with a rudimentary theory we wish to test. In this as in many other respects the cultural historian does not differ all that much from his predecessor, the traveller to foreign lands. Not the professional traveller who is only interested in one particular errand, be it the exploration of a country's kinship system or its hydro-electric schemes, but the broadminded traveler who wants to understand the culture of the country in which he finds himself.

12. See Chatterjee 2014, Kandel 2012, and Starr 2013, among many others.

13. This is not to say that private formats and shared rules are mutually exclusive. We will see examples where the former makes use of the latter when we visit the poetry of Wallace Stevens and the drip painting of Jackson Pollock.

14. There are other possible explanations for why the rules were abandoned. I discuss one of them in chapter 12. My fundamental aim, however, is to frame modernism in terms of the abandonment of rules and the consequences of that abandonment. Precisely why that happened is a separate matter.

15. The name comes from those artists whose works were rejected by the official Paris Salon of 1863. In response to complaints, Emperor Napoleon III authorized a parallel Salon des Refusés, hence the name.

Downloaded from http://direct.mit.edu/books/book-pdf/2437419/book_9780262356947.pdf by guest on 21 November 2024

Chapter 2

1. This is actually quite a curious fact because language and arithmetic are alike in formally interesting ways. Both are infinite. There is no upper bound on the number of numbers. There is no upper bound on the number of sentences. Moreover, natural language is recursive and so, too, is arithmetic. It is odd, therefore, that no natural language ever makes use of counting in a grammatical rule.

Chapter 3

1. One much earlier example might be that pointed out by Morris Halle and John McCarthy (1981). The authors argue that the lines of Psalm 137 form an outline of the temple in Jerusalem destroyed by the Babylonians in 586 BC, the subject matter of the psalm itself. Such pattern poems are rare in Hebrew. The authors suggest that the psalm might well be an imitation of an earlier Greek model. In any case, it is not clear to what extent such patterns would be obvious to readers or to what extent they would be hidden formats.

2. My thanks to Marc Lowenthal for calling my attention to this visual example of an Easter egg, to complement the musical and poetic ones that follow.

3. I am grateful to Oliver Halsman Rosenberg for this illuminating and air-clearing communication.

4. In another illuminating personal communication, Marc Lowenthal writes:

> I think there is perhaps more Easter-egging going on here, though, as the poster also references a painting by Roland Penrose, a UK associate of the surrealists: a portrait he did of his wife titled *Winged Domino* (1937), whose eyes and mouth are covered in butterflies, so it is sort of combining two surrealist images together into one (and the real morbid theme related to the movie would be the book Penrose's wife, Valentine Penrose, is best remembered for—translated into English by Alexander Trocchi—*The Bloody Countess*, based on the true story of a 17th-century Hungarian countess Erzsebet Bathroy, who would bathe in the blood of tortured young virgins to maintain her youth).

Knowing this, if they do not already know it, can only add to the sense of the Halsman estate that the image has fallen in with evil companions.

5. As early as 1942, the R.J. Reynolds Tobacco Company used the slogan "I'd walk a mile for a Camel." The slogan was active for at least a quarter of a century. Some readers of this book may even remember it. The reason why it was so memorable is that it contained an Easter egg in the same way that the FedEx logo contains an arrow. Roman Jakobson, the famous linguist, pointed out that the word *Camel* was in the slogan twice. He was referring to the phrase *walk a mile*. It contains the same three consonantal sounds, /k-m-l/, as the brand name *Camel*.

6. I originally came upon this transcription (Schrade 1956) in Newes 1990, 228. Unbeknownst to Newes at the time, the transcription contains an error: measure 20 in the tenor part indicates a whole note D. It should be a whole note B. Consequently, measure 21 will also need a B in the cantus. The reason for

Downloaded from http://direct.mit.edu/books/book-pdf/2437419/book_9780262356947.pdf by guest on 21 November 2024

supposing that the transcription contains this error is that there are five main manuscripts of the Machaut rondeau, A, B, Vg, E, and F-G. All of them show a B in measure 20 of the tenor part and consequently a B in measure 21 of the cantus.

Newes conjectures that Schrade may have reproduced the erroneous D in place of the correct B from an early edition published by Johannes Wolf in his *Geschichte der Mensuralnotation von 1250 bis 1460*, Leipzig, 1904/R1965, no. 22, based on manuscript G. Be that as it may (pun intended), in the interest of accuracy, I am grateful to Virginia Newes (personal communication) for bringing the error and its possible provenance to my attention.

7. A well-known contemporary example of chiasmus can be found in John F. Kennedy's inaugural address of January 20, 1961: "Ask not what **your country** can do for **you**—ask what **you** can do for **your country**."

8. Virginia Newes (personal communication) points to Günther 1983 for the practice of including performance instructions in the poetic text that accompanies a composition:

> A small number of compositions from the second half of the fourteenth century have texts that include significant information—both direct and hidden—concerning the correct manner of performing the music in question. The clues are of many different sorts, and involve such elements as the layout of the composition in the manuscript, the structure of the text, the poet's actual words and the deeper meaning of the text. Most of these compositions are unusually artful works, retrograde rondeaux, canons or partly canonic pieces, written in a terse, enigmatic manner.

It may well be that the composer/poet had no thought of an audience other than the performer. The poem lets the cat out of the bag. Assuming, of course, the reader has the perspicuity and patience to decipher it.

9. Granson spent extended periods in England and he and Chaucer enjoyed "a long friendship" according to James Wimsatt (1993, 213), who says:

> The *Complaint of Venus* provides our best clues to Chaucer and Granson's relationship. Implicitly, it is a tribute by Chaucer to his noble friend, being a triple ballade that translates three of the five poems in Granson's five-ballade sequence, called in one manuscript *Les cinq balades ensievans*.

I am indebted to Virginia Newes (personal communication) for this reference.

10. It is difficult to say if this similarity is the result of conscious influence on Chaucer by Machaut. Speaking of Chaucer, Wimsatt (1993, 77) says, "As his own artistry developed subsequently, it stands in important ways closer to Machaut than it does to any writer of whatever century or country." Unlike the relationship between Chaucer and Granson, there is no evidence that Chaucer and Machaut ever met, even though their lives overlapped chronologically. Machaut was born around 1300, Chaucer in 1343. Chaucer was 34 years old when Machaut died, in 1377.

11. Even so careful a critic as Wimsatt failed to notice Chaucer's distinctive alteration of the verse we have just examined. That stanza, the initial stanza of Granson's "Ballade II" (Skeats's labeling), immediately follows the final stanza of

Downloaded from http://direct.mit.edu/books/book-pdf/2437419/book_9780262356947.pdf by guest on 21 November 2024

"Ballade I," a stanza that Wimsatt (1993, 218) discusses in great detail. This in itself is an indication of how well-hidden Easter eggs are.

12. It would be intriguing to investigate the difference between the categories.

Chapter 4

1. See Kirby-Smith 1998 for an extensive account of free verse in the history of English poetry.

2. This is precisely the kind of statement that Stravinsky had in mind when he wrote (1947, 64), "And yet which of us has ever heard talk of art as other than a realm of freedom? This sort of heresy is uniformly widespread because it is imagined that art is outside the bounds of ordinary activity." In appendix A, I quote the full passage from which this insightful comment is drawn, because it is such an eloquent statement on the part of a major composer of the need for rules.

3. Charles Baudelaire to Arsène Houssaye (Baudelaire 2008, 3). It is worth noting that Baudelaire is longing for something that already existed in the form of Gregorian chant. See the discussion of sound poetry in chapter 7 for an example of Gregorian chant in poetry.

Chapter 5

1. As Schlegel writes in *Die Kunstlehre* (1801, 225): "'Art' is 'a boundless thought'"; "its purpose, that is, the direction of its striving can surely be indicated in general terms, but what it can and ought to achieve over the course of time no concept of the understanding can grasp because it is infinite." [Translation from Chomsky 2009, 103–104]

2. Eric Reuland (2016, 256) draws an enlightening dichotomy between what we can imagine and what we can accomplish. As he puts it, "One part of our mind is able to imagine and create systems that another part of our mind is unable to deal with." He explores the consequences of this in terms of large-scale human activity such as contemporary bureaucratic societies. We can imagine utopias, but we can't build them. Reuland's faculty of imagination is essentially Schlegel's Poetry with a capital P. Unlike Schlegel, however, Reuland calls attention to the downside of human nature: namely, our ability to imagine well beyond our ability to implement. In short, our eyes are bigger than our stomachs. That could very well be humankind's Achilles' heel.

3. Eric Reuland (2016, 264) likens poetic meanings to numbers. Meanings, like numbers, derive from a logic of recursive combinability. That is to say, all meanings are already there in the head, just as all numbers are. And they are each the result of a system that produces a discrete infinity (i.e., an infinite number of discrete objects), just like a grammar of English or a random number generator. The poet's job is to create "new meanings" by pairing preexisting meanings in novel ways. Thus, Graham has paired "snow," "world," "bone," and "transparency." That is undoubtedly a novel, one-time skein of concepts. Now it is up to the reader to figure out what it means.

Downloaded from http://direct.mit.edu/books/book-pdf/2437419/book_9780262356947.pdf by guest on 21 November 2024

For Reuland, the theoretical implication of this view is that the meaning is not the product of new creations. Rather, it is the product of associations between concepts that are already there once and for all. One implication of this is that, for example, Augustus Caesar had the notion of an iPhone in his mental space. It's just that he hadn't made the necessary connections to become aware of it.

4. Below I will venture a speculation on why this might be so. But first I need to lay out my entire argument. I beg your indulgence.

5. Philosopher Jerry Fodor once said that the past isn't a record of what happened; rather, it's a theory of what happened. I mention this because my description of the cemetery is without doubt a product of P creating a memory consonant with "a world of bone." After all, my visit to Dürnstein was a long time ago.

6. Answering Stokes's question of "what meaning counts for" isn't made any easier by the fact that although we human beings are extremely good at meaning things, we really haven't any coherent theory of what it means to mean something. Colin McGinn (1993, 62ff.) offers a profound and important insight into what this implies with respect to human cognition. In a nutshell, he suggests that meaning is so slippery precisely because we do not have the cognitive ability to understand what it is we are doing when we are meaning something. If we knew what we were doing, then poems like "San Sepolcro" would most likely be less mysterious. As it is, when faced with "San Sepolcro" and its ilk, we just have to muddle through.

As McGinn says (1993, 75), "For, to speak broadly, it is hard to see how we could ever produce a full theory of our semantic capacities without achieving a general understanding of mind."

Chapter 6

1. There is a large and growing literature on metrics offering competing systems. I choose one because of its relative ease of presentation, one based on the notion of a "stress maximum." Hayes, Wilson, and Shisko (2012) argue that the principle of the stress maximum is "vacuous," since all of its work can be done by independently motivated gradient-based constraints. I will not pursue technical metrical issues here, the reason being that it doesn't matter which metrical system prevails, only that there be a system, something all metricians agree on. In that regard, I wholeheartedly adopt Hayes, Wilson, and Shisko's (2012, 692) sentiment that

> English phonology makes available a vast number of prosodically distinct line types. For this reason, metrical intuitions are unlikely to be based on memorization of types but must result from general principles, which we assume take the form of a metrical grammar. As elsewhere in linguistics, we seek to construct grammars faithful to native-speaker intuition by scrutinizing the available data. We also seek to ground our metrical grammars in theoretical principles governing what such grammars can be like. These research goals have long characterized generative research in metrics starting with Halle & Keyser 1966, 1971.

Downloaded from http://direct.mit.edu/books/book-pdf/2437419/book_9780262356947.pdf by guest on 21 November 2024

2. Poets often allow themselves an unstressed extrametrical syllable at the end of a line. Such a syllable can turn the last stressed syllable into a stress maximum, but since that position is only mappable to an S, it has no effect on the metricality of the line. In the Chaucer example discussed earlier, there is a couplet that exhibits precisely this behavior:

Often to chaunge hewe and contenaunce,
Pleyne in slepyng, and dremen at the daunce,

Because a final *-e* is not "silent" in Chaucer's English, the extrametrical *-e* at the end of each line turns the preceding syllable into a stress maximum. Had it been silent, the last syllable would have been stressed, but would not have qualified as a stress maximum. I will return to the matter of extrametrical syllables in note 17.

3. I will have occasion later on to abandon "syntactic constituent" in favor of "prosodic constituent," following Hayes 1989. That change will not affect the argument just offered.

4. For an excellent discussion, see McKie 1997.

5. It shares a number of properties with skaldic heroic verse of the Middle Ages. Skaldic verse also exhibits end rhyme and alliteration. What is remarkable is that there is only one poem of this sort in the Old English canon. In the Middle English canon, one of the period's greatest poems, indeed one of the gems of English poetry, *Gawain and the Green Knight*, exhibits both alliteration and end rhyme. For a technical discussion of the significance of the metrical and rhyming practice in *Gawain and the Green Knight* with respect to the evolution of stress placement in English, see Halle and Keyser 1971.

6. In Old English, primary stress was always on the initial syllable of the root. Thus, a word like *veránda* would have been stressed on the first syllable: *véranda*.

7. Here and throughout, sequences enclosed in /…/ are intended to direct attention to how the enclosed sequences sound. Thus, /ay/ refers to the sound of /ay/ in, for example, the name Jay.

8. I take my text from Mackie 1922.

9. If the onset is empty—that is, if the word begins with a vowel—add /ay/ to the end; thus, *out+ay*. There are dialects of Pig Latin. Some add the sequence /yay/ and others /way/ when an empty onset is copied: thus, *out* + *way* or *out* + *yay*.

10. Think of *upercalifragilisticexpialidociousay.*

11. In Anglo-Saxon verse, all vowels alliterate with one another. In terms of the analysis given here, this will follow automatically since the relevant onset, the one before the stressed vowel, will be empty, and empty alliterates with itself.

12. I limit my discussion primarily to perfect rhyme. English has a variety of other types: alliteration, assonance, consonance, reverse rhyme, pararhyme, feminine rhyme. For these see, for example, Leech 1973. I believe that perfect rhyme, by far the most common, is sufficient to make the point intended: namely, that rhyme, like meter, depends on a shared set of rules. Obviously, this assumption extends to all the other types.

Downloaded from http://direct.mit.edu/books/book-pdf/2437419/book_9780262356947.pdf by guest on 21 November 2024

13. The subscript on stressed vowel indicates that the two vowels must be identical. For the sake of simplicity, I use letters of the alphabet. However, we mustn't lose sight of the fact that we are talking about the sounds the letters represent. Rhyme is an aural device, not a visual one.

14. Rhymes like *more:uproar* in the Keats poem require some comment. The compound *uproar* has primary stress on the first element /úp/ and secondary stress on the second element /ròar/, úpròar. This is typical of compound stress in English. As the Keats rhyme shows, the secondary stress in the second element is sufficient to engage the rhyme.

This, then, is how the last line scans:

Make pleasing music, and not wild úpròar
| | | | | | | | | |
W S W S W S W S W S

The word that corresponds to the final metrical position in the line is roar. This example shows that for purposes of rhyme, primary /ˊ/ and secondary /ˋ/ stresses count as identical. In this rhyming pair, móre:úpròar, X = /m/, Y = /r/, Z = /úpr/, and the stressed vowel_a = /o/.

15. Higgledy piggledy achieved metrical fame as the required opening line of the light verse form called the double dactyl (SWWSWW). Other nonsense phrases are also possible: jiggery-pokery, for example, or pocketa-pocketa. Here is an example of the form by John Hollander:

Higgledy piggledy,
Benjamin Harrison,
Twenty-third president
Was, and, as such,

Served between Clevelands and
Save for this trivial
Idiosyncrasy,
Didn't do much.

A second requirement of the verse form is that at least one line of the second stanza, preferably the antepenultimate line, must be occupied by a single double-dactyl word. Here, *idiosyncrasy* occupies the penultimate line. Whichever line the word appears in, the verse form's creators Anthony Hecht and Paul Pascal, when they made up their rules in 1951, declared that the versifier must never knowingly use that word again.

16. The fourteener is usually iambic.

17. Rhyme is a property of words, even very long ones, as we have seen. However, there are times when one word can rhyme with two words. The following couplet from Chaucer's *The Pardoner's Tale* (lines 671–672) is illustrative. Here, a rhyming word extends into the allowed extra unstressed position beyond the metrical line's last position (indicated with a lowercase *w*). Sometimes a separate word can slip in:

That straight was comen from the court of Rome.
W S W S W S W S W S (w)
Full loud he sang "Come hither love to me."
W S W S W S W S W S (w)

Downloaded from http://direct.mit.edu/books/book-pdf/2437419/book_9780262356947.pdf by guest on 21 November 2024

Keep in mind that in Chaucer's English, *Rome* would have rhymed with *coma*. Its final *-e* was pronounced, as was the final *-e* in *love*. George Gordon Lord Byron's *Don Juan* teems with such rhymes. Here is a couplet from canto I, stanza 7:

> Finding themselves so very much exceeded
> In their own way by all the things that she did.

There are formal ways of dealing with these cases. For example, we might assume that unstressed words like *me* in Chaucer and *did* in Byron have been cliticized onto the preceding word, like *gimme* from *give me*. That is, for the purposes of rhyme determination, *to me* and *she did* are considered a single word, albeit one ending in a clitic. In that case, the template given for *higgledy piggledy* will suffice. Since this is not a treatise on rhyme, I will stop here, hoping that the point about internalized knowledge in the form of rules has been made.

18. This may not be the last word, however. Consider the following fourteener done up for the occasion:

> *The Human Race*
>
> I promise that I will remember.
> (How could I forget?)
> The day that I became a member
> Fills me with regret.

What about the rhyme *remember:member*? A bona fide example appears in the song "Members Only" from the musical *Naked Boys Singing*, where the closing line is *Remember the member*. This is a line with internal rhyme. To my ear it is a perfect rhyme. Others aren't so sure. From a very haphazard personal survey, I have determined that opinions vary. As with Pig Latin, what constitutes legitimate rhymes appears to be subject to dialectal differences in certain instances, like this one. If you hear the rhyme as perfect, then it is safe to say that the rules discussed so far are the rules you have internalized. But if you do not hear it as perfect—that is, if you analyze (unconsciously, of course) *remember* and *member* as having identical onsets [(re) + $[m]_{X = onset}$ + $[é]_{stressed\ vowel}$ + $[mber]_{Y}$]—then you hear the pair as a so-called identical rhyme (*loan/lone*). Listeners who hear it this way will have a slightly different definition of rhyme, something like this:

> Two words rhyme if their stressed vowels and everything to their right are identical and if their onsets are not.

In either case, the point that rhyme depends on rules shared between the poet and the audience remains.

19. /shm/ reduplication has a rich history in the linguistic literature. Andrew Nevins and Bert Vaux (2003) present an excellent survey, including their own theoretical account based on what they call "anchor points," places in a word where things happen, like putting /shm/ in place of the initial onset of a word. Other anchor points include a syllable containing a stressed vowel (rhyme), the first element of the word-initial onset (alliteration), and so on. The number of different /shm/ dialects is impressive. For example, in their sample the dialect exhibited by the headline writer puts /shm/ in the initial onset of *collusion*. This turns out to be a minority dialect. It occurs 13% of the time in their sample. The

Downloaded from http://direct.mit.edu/books/book-pdf/2437419/book_9780262356947.pdf by guest on 21 November 2024

dialect that places /shm/ in the onset of the stressed syllable, *coshmúsion*, occurs 34% of the time, almost three times more frequently.

20. I promised earlier that the rules of rhyme and alliteration are rules that you already know by virtue of being a speaker of English, independent of their use in poetry. I also promised that I would force you to actually use those rules before the excursus into rhyme and alliteration concluded. I herewith fulfill that promise. You had to have those rules in your head to get the headline writer's joke.

21. English exhibits an asymmetry worth noting. I pointed out that a syllable consists of two parts, an onset and a nucleus. In everything we have discussed thus far, however, the nucleus has played no role. This does not mean that its existence is questionable. Although a proof would take us very far afield, the fact is that the nucleus of a syllable is critical in the rule system that accounts for stress placement in English words. The onset, however, plays no role at all.

22. The discussion of Yeats's "Broken Dreams" below offers an example of an unmetered poem that rhymes, but erratically and not within a precise rhyme scheme.

23. The mere fact that Milton felt it necessary to write an apologia for eschewing rhyme shows that he anticipated shared metrical knowledge on the part of his audience.

24. The poems of John Berryman might offer a counterexample to this generalization, but his rhyme schemes are considerably looser. "Dream Song 29" is a good example. It is fundamentally written in iambic pentameter, but with line lengths varying from two syllables to fifteen syllables and with a rhyme scheme that varies from stanza to stanza. (There are three.) A study of the relationship between meters and their accompanying rhyme schemes would be interesting. But since the matter falls outside my current concerns, I leave it here.

25. I assume *passing* and *blessing* are meant to be consonantal rhymes as well as the pair *known* and *on* a few lines later.

26. He wrote four connected pamphlets on the topic between the years 1643 and 1645: "The Doctrine and Discipline of Divorce," "The Judgment of Martin Bucer," "Tetrachordon," and "Colasterion."

27. In commenting on poems by H. D. ("Oread") and William Carlos Williams ("Flowers by the Sea"), Kirby-Smith (1998, 45) makes the same point in a flourish of exclamation points:

> The patterning also says to us: "Do not listen for regular rhythms! Suspend your requirements for all equivalence! Use your eyes! See what I'm talking about!"

28. Curtiss (2014, 136–137) describes the technique for eliciting judgments from Chelsea:

> The rhyming task involves a four-picture array [e.g., pictures of pie, cake, tea, and a tie] in which the pronunciation of two of the four items pictured constitutes rhyme; a third item is a phonological foil, and the fourth, a semantic foil. The tester names the four items pictured, and the task is to point to the two items that rhyme. The pronunciations of the rhyming items differ from each other by only one distinctive feature. A pretest is given to ensure that the task is understood.

Downloaded from http://direct.mit.edu/books/book-pdf/2437419/book_9780262356947.pdf by guest on 21 November 2024

29. An alternative scansion of the line as iambic pentameter is possible.

(and) Never, never, never, never, never
W S W S W S W S W S (w)

This scansion maintains the metrical status of the line by treating it as a headless line with an extrametrical syllable at the end, highly unlikely since Shakespeare does not make use of extrametricality elsewhere in the play. Moreover, accepting this scansion loses the point about Shakespeare pushing the meter to the very edge of acceptability but not beyond. Hayes's hypothesis, on the other hand, allows us to treat meter on a par with rhyme in that both are processes defined exclusively within the phonological component. To give all that up for the sake of an unlikely, even torturous, scansion seems wrong.

30. Eric Kandel (2012, 442) says, "Storytelling and representational visual art are low-risk, imaginary ways of solving problems." This is very insightful. It also points up the need for a theoretical framework within which problems can be stated and in terms of which solutions are forthcoming. That is to say, it points up the need for rule sets that one might reasonably attribute to artist and audience within which problems—for example, "Is the line metrical?"—can be posed. An important aspect of this point of view is that the aesthetic pleasure is purely internal. There is no connection between what the brain is doing when it determines metricality and some evolutionary goal, such as strengthening social bonds among members of a group. (Compare Dissanayake 2008 for arguments that art arose in part as a result of evolutionary pressure directed toward social bonding.)

31. At my wife's suggestion, I wrote to a gallery that represented Mr. Safer, describing my experience and asking if my interpretation was correct. Much to my surprise, John responded personally. He said that I was absolutely correct and that the intent of the sculpture, originally given to the Harvard Law School by John's class, was to show that the law is a weapon as well as a shield and that lawyers should never forget that.

John invited my wife and me to visit him at his home in the Washington, DC area. We became fast friends. I learned that the sculpture had been moved to its present location on the margins of the university when Harvard Law School was remodeled. I undertook a campaign to have the sculpture shifted to a more central location, one where Law School students would encounter it on a daily basis and perhaps take its lesson to heart. Sadly, my accident put an end to my campaign. As far as I can tell, the statue continues to languish on the outskirts of the Harvard campus awaiting its long-overdue recognition.

Chapter 7

1. Neither Jackendoff nor Lerdahl thought of music as a language like English; rather, they thought of it as a cognitive system arising out of natural mental capacities. Here is Lerdahl (2009, 187; see also Lerdahl 2019, chap. 2) on the subject:

> Noam Chomsky changed the intellectual landscape of the 1960s with his reformulation of linguistic theory as the formal study of the human capacity

Downloaded from http://direct.mit.edu/books/book-pdf/2437419/book_9780262356947.pdf by guest on 21 November 2024

for language (Chomsky, 1965). In the early 1970s, Ray Jackendoff and I concluded that music might be studied in similar fashion. Our interest was not in a literal transfer of linguistic to musical concepts, as Leonard Bernstein (1976) attempted. Rather, it was Chomsky's way of framing issues that attracted us: the supposition of specialized mental capacities, the belief that they could be studied rigorously by investigating the structure of their outputs, the distinction between an idealized capacity and its external and often accidental manifestations, the idea of a limited set of principles or rules that could generate a potentially infinite set of outputs, and the possibility that some of these principles might be unvarying beneath a capacity's many different cultural manifestations.

2. For a discussion of the role of grouping in the visual arts, see Ramachandran and Hirstein 1999, 21ff.

3. In the entry under *scat singing* on Wikipedia, Jelly Roll Morton is quoted as saying that he used scat as early as a 1906 recording.

4. On *Futura: Poesia Sonora*, performed by Hanna Aurbacher, Theophil Maier, and Ewald Liska, known as Trio Exvoco.

5. In his diary *Flight Out of Time* (1974, 71), Ball explicitly refers to this kinship in describing the premiere of his "Verse ohne Worte" (poetry without words) in July 1916 at the Cabaret Voltaire, a nightclub that he, along with Emmy Hennings, had recently founded in Zurich: "Then I noticed that my voice had no choice but to take on the ancient cadence of priestly lamentation, that style of liturgical singing that wails in all the Catholic churches of East and West."

Chapter 8

1. V. S. Ramachandran (2004, 47) puts it this way: "In other words human artists through trial and error, through intuition, through genius, have discovered the figural primitives of our perceptual grammar."

2. Ray Jackendoff (personal communication) once insightfully suggested that it might make more sense to think of the brain not as passively recognizing faces but as constantly searching its environment for faces. That strategy might even extend beyond facial recognition to all the dedicated categories of the brain, including body and place.

3. The reference to Kanwisher 2001 should probably be to Downing et al. 2001. In Kandel's reference list for the chapter in which this quotation appears, there is no entry for Kanwisher 2001.

4. These techniques include studying deficits in neurological patients, transcranial magnetic stimulation in humans, intracranial electric recording in neurosurgery patients, and studies of monkey neurophysiology.

5. This connection between privileged categories of the brain and art has been pointed out by a number of neuroscientists. For example, Chatterjee (2014, 27) asks, "Is it a coincidence that much of visual art is about landscapes, portraits, nudes, and still lives? Is it also a coincidence that we have an area specialized for biological motion and that dance is such a popular form of art?"

Downloaded from http://direct.mit.edu/books/book-pdf/2437419/book_9780262356947.pdf by guest on 21 November 2024

6. The full force of the Mahler reference will be apparent in the next chapter.

7. Kandel (2016) argues that what changed over the course of Western art's evolution is the relative weight assigned to hardwired functionalities of the brain. Thus, for some painters (e.g., Turner and Rothko), color dominated FFA, PPA, and EBA, and for others (e.g., Mondrian), line and color became dominant. Kandel's book can be read as an exploration of these shifts in dominance, a process Kandel calls "reductionism in art."

8. A pertinent collection of articles and commentaries focusing on art and the brain can be found in volume 6, nos. 6–7 of the *Journal of Consciousness Studies*. There, Nicholas Humphrey (1999, 117) argues that "[c]ave art, so far from being the sign of a new order of mentality, may perhaps better be thought the swan-song of the old." He takes this position because of the similarities between cave art, as he sees it, and the work of a famous autistic child, Nadia, who produced remarkably mature sketches when she was extremely young, starting at three years of age. The argument and its rebuttals are worth looking at, as is, indeed, the whole volume.

9. I am indebted to Steven Pinker's (2002) discussion of this painting. His take on the high arts in the postmodern world is also worth thinking about.

Chapter 9

1. I find it appropriate that I write this less than a month into my eighty-first year.

2. Bach used the so-called Bach motif (B♭-A-C-B) in, among other places, *The Art of the Fugue*. The crucial difference is that Bach and his nineteenth-century imitators of the device did so within a tonal framework. For them, the tonal motif was the Easter egg. It was there to be discovered, but it had no effect on the aesthetic pleasure derived from listening to the music. Schoenberg abandoned the tonal center and used the device as the central (and inaccessible) organizing principle. Others used different atonal devices. See, for example, Taruskin's discussion of Richard Strauss's opera *Salome*.

3. A sentence so constrained is called a heterogram. The French writer Georges Perec, famous for having written an entire novel without the letter *e*, composed a number of poems based on the heterogram. Perec was a member of the Oulipo Group, a French society devoted to finding new forms of literature including, for example, the heterogram. I am indebted to Marc Lowenthal for pointing this out.

4. As part of a course on hidden structures, I assigned as a homework task looking for other examples in Wallace Stevens's poetry. Peter Trapa, a third-year graduate student in mathematics at MIT, found "Theory." I thought his discovery was brilliant. I could not help thinking that that kind of expertise and level of education is what it takes to crack the private code of many twentieth-century poets.

5. There is a theory of literary criticism called "reader response" that argues that a text has no meaning before a reader reads it. "Theory" seems a counterargument since the key to the meaning of the poem is intricately bound up in the text—that is, in its Easter egg. A reader can always supply a meaning to the poem. But as the role of *women* shows, if the reader doesn't take the Easter egg into account, the

Downloaded from http://direct.mit.edu/books/book-pdf/2437419/book_9780262356947.pdf by guest on 21 November 2024

reading is bound to be misinformed. After all, the role of *women* in the poem can hardly be deemed accidental.

One could argue, I suppose, that the Easter egg is irrelevant since the reader's task is to assign meaning to whatever the reader perceives the text to be. Viewed this way, the reader and the poet are like the images on the Russell Connor *New Yorker* cover. They are looking past one another. Clearly, the poet is aware of the Easter egg, having put it there. But the poet doesn't care whether the reader gets it or not. The reader, on the other hand, makes whatever hay he or she can out of the perceived text, including that version of the text wherein the Easter egg lies undiscovered. This seems like a pointless activity since it reduces the poem to a Rorschach image. However, *chacun à son goût*. Where does that leave me? I'm trying to figure out what the poet is doing. For my purposes, the text is indispensable.

6. In chapter 10, we will see an important parallel between "The Snow Man" and Jackson Pollock's drip paintings. They share the property of private formats tapping into a specific hardwired function of the brain, namely, recursiveness.

7. When I use the terms *nearest* and *farthest*, I am referring to linear order. But as we have already seen, when it comes to language, these distances are best understood in terms of tree structures. Indeed, the appropriate tree for this sentence would show that *fell* is the "nearest" verb to the subject *horse*, just as *swim* was the "nearest" verb to *instinctively* in the sentence analyzed in chapter 2. From this point of view, we can say that a listener who hears the sentence *The horse raced past the barn fell* is led astray by taking the first verb encountered to be the nearest verb.

8. The famous Oakhurst Dairy "Oxford comma" case hinged on the placement of a comma that made all the difference between the company paying or not paying overtime for distribution of its products. The critical sentence intended to specify precisely what was exempt from overtime wages was this:

> The canning, processing, preserving, freezing, drying, marketing, storing, packing for shipment or distribution of:
>
> (1) Agricultural produce;
>
> (2) Meat and fish products; and
>
> (3) Perishable foods.

The so-called Oxford rule would have placed a comma after the phrase *for shipment*. That would have made it absolutely clear that overtime payment for distribution of products was exempt. As the sentence reads without the comma there, all that was exempt was packing. Drivers claimed that they were entitled to overtime payment for distribution. At least one court agreed with them.

9. The triangle dangling from the symbol *S* (for *Sentence*) means that the clause beneath the triangle is a single sentence.

10. The third structure, [*John and Mary and Bill*], is not possible.

11. The dangling *nothing himself* is a syntactic adjunct that is outside the main structure of the poem. Such adjuncts are basically orthogonal to the syntax, and I will simply note this in passing without further comment.

Downloaded from http://direct.mit.edu/books/book-pdf/2437419/book_9780262356947.pdf by guest on 21 November 2024

12. To say that this is a dismal thought is to fall into Stevens's trap of seeing the world through a glass humanly. But what else can one do? To see reality, one must give up being human. But if one gives up being human, one will never see reality. It is a catch-22. A discussion of this poem and its obvious affinity to "The Emperor of Ice-Cream" might have been a help to Miss Wirtz. From the point of view of Poetry, they are, if not the same poem, certainly in the same poetic ballpark.

13. It is really not that hard to imagine what it might be like to see the world shorn of our humanity. Imagine looking up into the sky on a clear night. We see tiny pinpoints of light that we call stars. We know, however, that this is a function of the resolving powers of our eyes. If they were much larger than they are—say, 100 feet wide for each eye—then we might be able to see the radio sky, huge blotches of visible energy. But, of course, our eyes can't be that large. If they were, the rest of our bodies would be too big to move on the earth, given its gravitational pull. Nonetheless, we have a glimpse of Stevens's Snow Man, thanks to scientific instruments like interferometers. We can look up at the sky, see the pinpoints of light, and know intellectually that it isn't like that at all. "The Snow Man" is the perfect title. But if one needed a substitute, I would offer "Cold Comfort."

14. I write this in hopes that someone will be moved to re-create that mobile.

15. Here is a typical example of the notice critics take of the single-sentence character of the poem, this from Harold Bloom (1977, 59):

> *The Snow Man* begins with the impersonal "one," but before the single sentence that constitutes the poem has finished bending back upon itself that "one" will have become "the listener," who is also the man of the title.

That is pretty much it. *Bending back upon itself* may represent an intuition on Bloom's part that something syntactic is at work here.

16. I return to this property when I discuss Jackson Pollock in chapter 10.

17. Perhaps it is no wonder that critics, contra Stevens, have focused on meaning to the exclusion of form. Since most poets do not bring the two together as Stevens and Chaucer do, there may not be much reason to. On the other hand, there may be many a poem that has buoyed its content on form like water wings on a baby and, because we have grown used to not looking for it, we have, not surprisingly, overlooked it.

18. Perloff (1993, 17n19) is at pains to say that indeterminacy is not a general property of all poetry, apparently a position held by Derridean theorists.

19. Perhaps this is what Duchamp meant when he said that the artist has no idea what he or she is doing and the only one that matters is the audience.

20. See the quotation from his Dada Manifesto below.

21. The similarity of this kind of relationship between poets and painters and their respective audiences is unmistakable in a work like Duchamp's *Large Glass*. Indeed, Perloff (1993, 34) has taken note of it:

> Duchamp's enigmatic *Large Glass* (*La mariée mise à nu par ses célibataires, même*), for example, exerts a special fascination for the viewer who keeps

Downloaded from http://direct.mit.edu/books/book-pdf/2437419/book_9780262356947.pdf by guest on 21 November 2024

> trying to extract meanings that the art work blocks at every turn. Art becomes play, endlessly frustrating our longing for certainty. A composition like the *Large Glass* is also a critique of the very criticism it inspires, mocking the solemnity of the explicator who is determined to find *the* key. In the same way, poetic texts like "These Lacustrine Cities" … derive force from their refusal to "mean" in conventional ways.

22. Tom Wolfe (1975) wrote a diatribe against the need for theory to bolster one's viewing of a modern painting, though without examining why there was such a need.

23. I am indebted to an online article by Roger Mathew Grant (https://aeon.co/essays/its-hard-to-know-why-music-gives-pleasure-is-that-the-point) for this reference to Twining's work. Grant concludes his quotation from Twining with this observation: "For Twining, then, it was precisely what music lacked in specificity that afforded pleasure." I can think of no better description of Perloff's defense of indeterminacy. What goes around comes around.

24. Popular songs represent the perfect marriage between music and poetry. The lyrics are the melody's narrative. No lack of specificity there. The songwriter/lyricist has laid it out for us. There is a rich literature dealing with the rules that map lyrics onto melodies. This would constitute one more rule set along with those already explored. But songs do not exhibit the kind of extraordinary change that the sister arts underwent. That is probably not an accident. Certain art forms resist radical change. Songs are one of those art forms. So, too, are plays.

25. There is a considerable literature arguing that storytelling is innate (see Boyd 2009, for example). I mention it here, though I am dubious. But should the claim turn out to be true, then the loss of narrative would be another rule set left behind when the rules that make up the natural aesthetic were jettisoned.

26. Cage's appearance on *I've Got a Secret* can be viewed on YouTube at https://www.youtube.com/watch?v=SSulycqZH-U.

27. Originally, Cage's score called for the radios to be turned on. However, a dispute over which union bore the responsibility for plugging the radios into the wall remained unresolved at show time. Cage improvised and decided that instead of turning the radios on, he would throw them to the floor.

28. *Water Walk* was composed in 1959. It premiered on *Lascia o Raddoppia*, a program televised in Milan, February 5, 1959. Its performance on *I've Got a Secret* came just over a year later on February 24, 1960.

29. Although he is talking about music, Stravinsky's remarks strike me as perfectly appropriate to the poetry of the obscure, such as Ashbery's or Graham's.

30. The notion of "revolution" was not limited to poetry and music, of course. Robert Solso (1994, 224–226), for example, describes what happened to painting in revolutionary terms:

> If Impressionism is experimental art, then modern art is revolutionary. Modern art, insofar as one can fit a dozen or more styles under a single label, is characterized by breaking all the rules of art. Linear perspective, illusions of depth, representational art, and even the subject matter of art were thrown

Downloaded from http://direct.mit.edu/books/book-pdf/2437419/book_9780262356947.pdf by guest on 21 November 2024

away in favor of an art searching for a theory. As Euclidean mathematics, Newtonian physics, and linear perspective dominated the intellectual thought of the previous generations, the twentieth century saw fundamental challenges to all of these traditional views.

No longer would the degree of linear correctness be the measure of a painter, as many modern artists created a sensation of depth in revolutionary new ways.

Chapter 10

1. Robert Solso (1994, 154–155) calls attention to research that measures eye movements of viewers when looking at various styles of art, so-called duration-of-fixation measures. The generalization that emerges is that more complex paintings—where "complex" is defined by a panel of experts—are coupled with shorter fixation times while less complex paintings are coupled with longer ones. Baroque art is classified as complex and abstract painting as less complex. Solso (p. 155) offers the following explanation:

> [O]ne could argue that in viewing abstract paintings, the viewer is trying to find a "deeper" meaning in each of the limited number of features—and thus spends more time on each

Be that as it may, in line with Aviv's observations, duration-of-fixation measures appear to constitute another way in which viewing abstract painting differs from viewing representational art.

2. A similar explanation, which I will address later, may lurk behind my friend's bursting into tears on viewing *White Center*.

3. Reported in an article by Steven McElroy entitled "If It's So Easy, Why Don't You Try It," *The New York Times*, December 3, 2010.

4. Taylor and his colleagues have claimed that their method is able to distinguish genuine from fraudulent Pollocks, a claim that has been challenged. The challengers argue that the method was unable to distinguish between a simple line drawing in Photoshop and a pattern characteristic of Pollock. Taylor and colleagues subsequently countered this challenge. For discussion of the issues, see Chatterjee 2014, 136, and Minkel 2007. Finally, Rehmeyer (2007) quotes mathematician Benoit Mandelbrot, the man who coined the term *fractal*, as saying "I do believe that Pollocks are fractal."

5. Arnheim (1974, 71) proposes a different rationale for the traditional preference for the rectangle of the golden mean:

> [T]he longer, horizontal side is related to the shorter, vertical side as the sum of both is to the longer. Traditionally and psychologically, this proportion of 1:.618 … has been considered particularly satisfying because of its combination of unity and dynamic variety. Whole and parts are nicely adjusted in strength so that the whole prevails without being threatened by a split, but at the same time the parts retain some self-sufficiency.

6. Even though this chapter is about recursion in painting, it should be noted that, like Pollock's drip paintings, music also exhibits recursive structure. Thus,

Downloaded from http://direct.mit.edu/books/book-pdf/2437419/book_9780262356947.pdf by guest on 21 November 2024

one can begin a piece in a particular key and then modulate into other keys ad infinitum before arriving back at the very end at the initial key. For example, Duke Ellington's "In a Sentimental Mood" has the typical A-A-B-A structure. The B section—the so-called bridge—is in D♭. The second A section modulates into that key. At the end of the B section, the bridge modulates back to the original D minor. But the composer could just as easily have modulated to G, and so on and so on. The only constraint is the A-A-B-A structure. If the B section were repeated over and over again, each repetition could be in a different key an indefinite number of times until the music exited the B section. In fact, it would be quite possible to modulate into more than one key inside the B section itself.

7. One wonders if Rothko himself felt such links between color and emotion. It would not be surprising if he did. I can think of one art form that hints at it. I'm thinking, of course, of the blues. There is a rich literature on color-emotion synesthesia, and Rothko's art may well be exploiting that connection. However, I can't think of any art form that exploits number synesthesia.

8. Thus, that portion of the brain dedicated to language production and processing provides the appropriate structural dependency hypotheses needed to parse "The Snow Man." Whether Stevens was aware of this is part and parcel of the question of whether Pollock was aware that he was creating fractal paintings. My guess is that the answer to both questions is no.

9. Martin Rohrmeier (2011, 35) writes, "Harmonic structure is argued to be at least one subsystem in which Western tonal music exhibits recursion and hierarchical organization that may provide a link to overarching linguistic generative grammar on a structural and potentially cognitive level." In other words, recursion may well play a role in the natural aesthetics of all the sister arts.

10. This comment makes it clear that while atonal music jettisoned pitch centers, it continued to rely on metrical (time signature) rules and grouping rules. It was John Cage in, for example, *Water Walk* who wrote "music" that abandoned all three.

11. For an extensive discussion of repetition, see Margulis 2014.

12. It is interesting to speculate that repetition in music enables the brain to group notes just as syntactic rules group words into constituents. Presumably, this would come about because two strings of notes, being identical, are then identifiable as a group.

13. Having visited Khajuraho in Madhya Pradesh, India, I can readily agree with Ramachandran's impressions. The 11 temples built by the Chandela dynasty are among the great wonders of the architectural world.

14. Morris Halle and I (Halle and Keyser 1999) discuss a purely metrical Easter egg in Robert Frost's poem "Design." Frost claimed that there are only two meters in English, loose and strict iambic pentameter. The interesting thing about "Design" is that it is metrically ambiguous between the two. That is, one can't tell whether the meter is loose or strict iambic until the last line. That line changes one's metrical perspective on the metricality of everything that went before. And that is precisely what the content of the last line does for the meaning of the poem.

Downloaded from http://direct.mit.edu/books/book-pdf/2437419/book_9780262356947.pdf by guest on 21 November 2024

Chapter 11

1. It was this review that triggered Tom Wolfe's diatribe *The Painted Word*.

2. Indeed, it could quite easily be slipped in somewhere in Ashbery's "These Lacustrine Cities" without causing a ripple—say, in the fourth stanza:

> So long as colorless green ideas sleep furiously the night is a sentinel.
> Much of your time has been occupied by creative games
> Until now, but we have all-inclusive plans for you.
> We had thought, for instance, of sending you to the middle of the desert …

3. Perloff refers readers to Carne-Ross 1973 as "one of the best discussions we have of the problems of interpreting the Cantos." I would agree and add that interpreting them is also an example of the onerous demands that Pound puts on his readers. If reading the Brownings is like going to the movies, reading *The Cantos* is like learning algebra. Perhaps that is why William Carlos Williams wrote, "A course in mathematics would not be wasted on a poet, or a reader of poetry" (Perloff 1993, 113). It is for each reader to decide whether the game is worth the candle, but a difficult game it certainly is.

4. *Le bain* was the title originally given to the painting by Manet, but, as King (2006, 87–88) explains:

> Spectators astonished and amused by the puzzling scene of Victorine Meurent sitting naked on the grass between two men in modern dress quickly dubbed the work *Le Déjeuner sur I'herbe*, or 'The Luncheon on the Grass,' a name by which even Manet himself began referring to the painting.

The spectators King refers to were those at the 1863 Salon des Refusés, where Manet along with 500 other artists displayed work that had been refused by judges of the official Salon.

5. Eric Kandel's view that *Le déjeuner sur I'herbe* represents "the complex relationship between the sexes and between fantasy and reality" (2012, 12) is certainly well within the eye of a beholder; but, for the reasons given here, I doubt seriously that was Manet's intent.

6. According to American sculptor and scholar Rhonda Shearer, Duchamp had subtly altered Mona Lisa's face to hide his own under hers.

7. I am thinking, for example, of the cave paintings at Lascaux, France, that are at least 17,000 years old.

8. Of course, Braque and Picasso did not pull cubism out of thin air. For example, Cézanne's *Still Life with Fruit Basket* (c. 1890) exhibits more than one point of view inside a single painting. For some discussion, see Solso 1994, 221.

9. Fifty years later, Andy Warhol made an equally audacious statement with *Campbell's Soup Cans*. Without its implicit statement about abstract expressionism, the painting would have no impact at all. Today it has attained iconic status.

10. The history of art usually takes a highly descriptive form, moving from one school to the next and classifying an artist as belonging to this school or that but without explanation. A study of the history of art from the time of Manet onward—that is, from the time when art began to be about itself rather than

Downloaded from http://direct.mit.edu/books/book-pdf/2437419/book_9780262356947.pdf by guest on 21 November 2024

about representation—from the point of view of the natural aesthetic and the way that artists danced with it would yield interesting results. First, however, one would need a deeper understanding of the mental representations that privileged categories of the brain make use of—categories like face, place, body, and others, color and geometrical shape no doubt among them.

11. Recall the discussion of Christopher and of Moro's experiments in chapter 2.

12. It seems to me that Chatterjee is conflating two different kinds of pressures. "Selectional" pressures are ones, I would suppose, that are imposed on an organism willy-nilly. Thus, the peacock had no choice with respect to the enhancement of his tail. He was at the mercy of Mother Nature wading in his gene pool. Then there are the pressures of the sort that gave rise to Socialist Realism in Stalinist Russia, pressures imposed, for example, by the Nazis when they labeled Marc Chagall and Paul Klee degenerate artists. Chatterjee's prediction is based on the latter kind of pressure. Artists could resist it, of course, but at the risk of being shot. The discussion that follows doesn't need to distinguish between the two sorts of pressures.

13. This is a position that goes way back. Eighteenth-century physician and philosopher Julien Offray de La Mettrie, for example, believed that intelligence and instinct were inversely proportional (see Vartanian 1960). Gains in one produced losses in the other. That captures the dynamic of the Bengalese finch's experience. Others have held the same view. For a discussion, see McGilvray 2009.

Chapter 12

1. For a concise but important description of the pre-Newtonian historical context and its aftermath, see Chomsky's account (personal communication) in appendix B. I strongly advise going there before continuing.

2. See Riskin 2016 for an entertaining account of the variety of mechanical devices created in the seventeenth century. For example (pp. 41–42):

> Hydraulic and mechanical figures had become routine. Treatises such as De Caus's and Evelyn's helped to spread familiarity with hydraulic antics below the sphere of popes and princes. Martin Löhner, a hydraulic engineer and the Master of Wells (Brunnenmeister) for Nüremberg, established a much-visited host of automata at his own comparatively humble house: Vulcan laboring at his forge; Hercules bludgeoning his dragon; Actaeon surprising Diana and her nymphs in their bath, whereupon Diana threw water at Actaeon, who turned away, grew antlers on his head, and was attacked by his own dogs; Cerberus spitting fire at Hercules; a lion emerging from his cave to drink from a basin, then retiring; the nine Muses, each engaged at her appointed art. Waterworks were de rigueur not only for popes, cardinals, archbishops, and kings but for ministers too. Richelieu had his own at his residence at Reuil. Evelyn, visiting in 1644, pronounced that garden "so magnificent, that I doubt whether Italy has any exceeding it." He recorded having been shot by streams of water, on his way out of one of Richelieu's grottoes, from muskets held by "two extravagant [automaton] musketeers."

Downloaded from http://direct.mit.edu/books/book-pdf/2437419/book_9780262356947.pdf by guest on 21 November 2024

3. The reference to great trombone players was inserted for my benefit. I play trombone, but I am not in the great class by a long chalk.

4. I suggested earlier that repetition might play a role in music as a way of enhancing its grouping component. I suspect that something more profound is at work, something hardwired that makes repetition in music, painting (fractals), and poetry (rhyme and meter) especially pleasurable.

5. Benjamin Boretz remembered the occasion and was kind enough to give me permission to quote it here. Something like the same sentiment was expressed by Lawrence Ferlinghetti in a 1963 conversation with H. T. Kirby-Smith (1998, 2) when he said with respect to writing in metrical verse, "It's just fine if you want to write sixteenth-century poetry." Both imply that the natural aesthetic had given rise to works of art whose time had come and gone.

6. As Arthur Danto (1995, 50) puts it:

> The world science tells us about is not at all required to *match* the world our senses reveal. But that was the entire point of the history of Vasarian painting.

That goal—to match the world that our senses reveal—had had a remarkably constraining effect on Western painting for seven hundred years.

7. This thoughtful scenario was suggested by an anonymous reviewer. Regretfully, I am unable to give credit where credit is due.

8. Recall Arthur Danto's (1995, 28) reference to Phyllis Freeman's work on manifestos.

9. Since music is an art form without meaning in the sense that poetry and painting have it, one cannot extend to it the loosening grip on content.

10. This is a crucial difference between those rules and the rules of grammar that enable us to speak to one another. Recall this passage from Schlegel in chapter 5:

> In poetry the expressive potentiality that is found in the arts is found to an even higher degree since other arts do after all have in light of their restricted media or means of representation [Darstellung] a determinate sphere of activity that could allow itself to be circumscribed to some degree.

Here, Schlegel touches on precisely this difference. Poetry is the art form whose fundamental rules cannot be discarded. The rules governing the sister arts, on the other hand, were replaceable. In music, tonal centers were replaceable. In poetry, meter and rhyme, adornments of grammatical output, were replaceable. In painting, catering to the privileged categories was replaceable. But Schlegel's identification of poetry as the highest art form corresponds to the fact that the rules governing its medium, the rules of grammar, are not accessible to the conscious mind. As I said, to discard them would be tantamount to discarding one's human nature.

To put it differently, poetry is the only art form whose medium defines its practitioners. *Homo sapiens* can live without music and without painting, however lusterless that life might be. But *Homo sapiens* without language and all that it entails would not be *Homo sapiens*.

Downloaded from http://direct.mit.edu/books/book-pdf/2437419/book_9780262356947.pdf by guest on 21 November 2024

11. We have seen that in certain of their works, Stevens's and Pollock's reinvented forms were based on natural cognitive endowment. We have also seen that Stevens could be completely obscure in a poem like "Theory"—indeed, in a great deal of his poetry. So, as I have noted earlier with respect to formats, it was not an all-or-nothing affair.

12. One wonders about other fields that might have hit this barrier and what they did or did not do about it. Take economics, for example. Was the mathematical modeling of Léon Walras in the latter half of the nineteenth century a Newtonian-like reaction to the economics that had preceded him? By way of contrast, unlike science and the arts, religion has, through the mechanism of immutable texts, invested a great deal in the status quo. Adherence to immutable texts ensures that practitioners will not move beyond the natural state of cognition that prevailed when the texts were written. The same is true in the realm of statecraft, where so-called originalists treat the Constitution of the United States as immutable. A study of the histories of science, religion, economics, government, and perhaps other fields in terms of the natural limits of the brain and how disciplines reacted to reaching those limits is one that most certainly ought to be undertaken; alas, not here.

13. By way of contrast, let me share my own epitaph, which, when the time comes, will read:

> Beneath this stone lies S. Jay Keyser,
> Who knows what's beyond and is none the wiser.

14. Weinberg (2017) discusses a number of difficult issues surrounding quantum mechanics. He outlines the problems with current theories, suggests possible ways to reconcile those problems, and ends his article with a line from Shakespeare's *Twelfth Night*: "O time, thou must untangle this, not I." Clearly Weinberg's heart inclines toward the *Wir müssen wissen. Wir werden wissen* school.

15. I would also throw into the hopper of skills beyond our potential that of living together in peaceful and cooperative harmony. Along with quantum mechanics, that may well be a skill above our mental pay grade.

Downloaded from http://direct.mit.edu/books/book-pdf/2437419/book_9780262356947.pdf by guest on 21 November 2024

References

Adams, John. 2010. "The Zen of Silence." *New York Times Sunday Book Review*, November 19, 2010.

Apollinaire, Guillaume. 1949. *The Cubist Painters*. 2nd ed. New York: Wittenborn, Schultz.

Arnheim, Rudolf. 1974. *Art and Visual Perception: A Psychology of the Creative Eye. The New Version*. Berkeley: University of California Press.

Ashbery, John. 2016. "A Disservice." *Boston Review*, May 18, 2016.

Aviv, Vered. 2014. "What Does the Brain Tell Us about Abstract Art?" *Frontiers in Human Neuroscience* 8. doi: 10.3389/fnhum.2014.00085.

Ball, Hugo.1974. *Flight Out of Time: A Dada Diary.* Translated by Ann Raimes. New York: Viking Press.

Ball, Philip. 2018. *Beyond Weird*. Chicago: University of Chicago Press.

Baudelaire, Charles. 2008. *Paris Spleen and La Fanfarlo*. Translated, with introduction and notes, by Raymond N. MacKenzie. Indianapolis, IN: Hackett.

Bell, John. 1990. "Against 'Measurement.'" *Physics World* (August): 33–40.

Bernstein, Leonard. 1967. "Mahler: His Time Has Come." *High Fidelity* (September): 51–54.

Bernstein, Leonard. 1976. *The Unanswered Question*. Cambridge, MA: Harvard University Press.

Berryman, John. 2014. *Collected Poems 1937–1971*. Edited and introduced by Charles Thornbury. New York: Farrar, Straus and Giroux.

Bever, Thomas G. 1986. "The Aesthetic Basis for Cognitive Structures." In *The Representation of Knowledge and Belief*, edited by Myles Brand and Robert M. Harnish, 314–356. Tucson: University of Arizona Press.

Bilgrami, Akeel. 2015. "Foreword." In Noam Chomsky, *What Kind of Creatures Are We?,* 3–47. New York: Columbia University Press.

Bloom, Harold. 1977. *The Poems of Our Climate*. Ithaca, NY: Cornell University Press.

Boyd, Brian. 2009. *On the Origin of Stories*. Cambridge, MA: The Belknap Press of Harvard University.

Downloaded from http://direct.mit.edu/books/book-pdf/2437419/book_9780262356947.pdf by guest on 21 November 2024

Carne-Ross, D. S. 1973. "The Music of a Lost Dynasty." *Boston University Journal* 21: 35–41.

Chatterjee, Anjan. 2014. *The Aesthetic Brain*. Oxford: Oxford University Press.

Chomsky, Noam. 1957. *Syntactic Structures*. The Hague: Mouton.

Chomsky, Noam. 1965. *Aspects of the Theory of Syntax*. Cambridge, MA: MIT Press.

Chomsky, Noam. 2009. *Cartesian Linguistics: A Chapter in the History of Rationalist Thought*. 3rd ed., with an introduction by James McGilvray. Cambridge: Cambridge University Press.

Chomsky, Noam. 2010. Some Simple Evo Devo Theses: How True Might They Be for Language? In *The Evolution of Human Language*, edited by Richard K. Larson, Viviane M. Déprez, and Hiroko Yamakido, 45–62. New York: Cambridge University Press.

Curtiss, Susan. 2013. "Revisiting Modularity: Using Language as a Window to the Mind." In *Rich Languages from Poor Inputs*, edited by Massimo Piattelli-Palmarini and Robert C. Berwick, 68–90. Oxford: Oxford University Press.

Curtiss, Susan. 2014. "The Case of Chelsea." In *Connectedness: Papers by and for Sarah VanWagenen*, edited by Carson T. Schütze and Linnea Stockall, 115–146. UCLA Working Papers in Linguistics 18. Los Angeles: UCLA, Department of Linguistics.

Danto, Arthur. 1964. "The Artworld." *The Journal of Philosophy* 61, no. 19 (American Philosophical Association Eastern Division Sixty-First Annual Meeting, October 15): 571–584.

Danto, Arthur. 1995. *After the End of Art*. Princeton, NJ: Princeton University Press.

Deliège, Irene. 1987. "Grouping Conditions in Listening to Music: An Approach to Lerdahl & Jackendoff's Grouping Preference Rules." *Music Perception* 4, no. 4 (Summer): 325–359.

Deutsch, David. 2011. *The Beginning of Infinity*. London: Penguin Books.

Dissanayake, Ellen. 2008. "The Arts after Darwin: Does Art Have an Origin and Adaptation Function?" In *World Art Studies: Exploring Concepts and Approaches*, edited by Kitty Zijlmans and Wilfried van Damme, 241–263. Amsterdam: Valiz.

Dowling, W. Jay. 1999. "The Development of Music Perception and Cognition." In *The Psychology of Music*, edited by Diana Deutsch, 603–625. San Diego, CA: Academic Press.

Dowling, W. Jay. 2001. "Perception of Music." In *Blackwell Handbook of Perception*, edited by E. Bruce Goldstein, 469–498. Oxford: Blackwell.

Dowling, W. Jay, and Dane L. Harwood. 1986. *Music Cognition*. Orlando, FL: Academic Press.

Downing, Paul E., Yuhong Jiang, Miles Shuman, and Nancy Kanwisher. 2001. "A Cortical Area Selective for Visual Processing of the Human Body." *Science* 293, no. 5539 (September 28): 2470–2473.

Downloaded from http://direct.mit.edu/books/book-pdf/2437419/book_9780262356947.pdf by guest on 21 November 2024

Eliot, T. S. 1965. *To Criticize the Critic and Other Writings*. Lincoln: University of Nebraska Press.

Epstein, Russell A., and Lindsay K. Vass. 2015. "Neural Systems for Landmark-Based Wayfinding in Humans." *Philosophical Transactions of the Royal Society B*. doi: 10.1098/rstb.2012.0533.

Fabb, Nigel, and Morris Halle. 2008. *Meter in Poetry*. Cambridge: Cambridge University Press.

Fitch, W. Tecumseh. 2006. "The Biology and Evolution of Music: A Comparative Perspective." *Cognition* 100: 173–215.

Fitch, W. Tecumseh. 2010. "Three Meanings of 'Recursion': Key Distinction for Biolinguistics." In *The Evolution of Human Language*, edited by Richard K. Larson, Viviane M. Déprez, and Hiroko Yamakido, 73–90. New York: Cambridge University Press.

Fitch, W. Tecumseh, Marc D. Hauser, and Noam Chomsky. 2005. "The Evolution of the Language Faculty: Clarifications and Implications." *Cognition* 97, no. 4: 179–210.

Friederici, Angela D. 2009. "Pathways to Language: Fiber Tracts in the Human Brain." *Trends in Cognitive Sciences* 13, no. 4: 175–181.

Gill, Kamraan Z., and Dale Purves. 2009. "A Biological Rationale for Musical Scales." *PLoS One* 4, no. 12.

Gombrich, E. H. 1956. *Art and Illusion*. Princeton, NJ: Princeton University Press.

Gombrich, E. H. 1969. *In Search of Cultural History*. Oxford: Clarendon Press.

Gombrich, E. H. 1995. *The Story of Art*. 15th ed. London: Phaidon Press.

Goodall, Howard. 2013. *The Story of Music. From Babylon to the Beatles: How Music Has Shaped Civilization*. New York: Pegasus Books.

Gopnick, Allison. 1998. "Explanation as Orgasm." *Minds and Machines 8, no. 1*: 101–18.

Greenberg, Clement. 1993. *The Collected Essays and Criticism. Vol. 4, Modernism with a Vengeance, 1957–1969*, edited by John O'Brien. Chicago: University of Chicago Press.

Grill-Spector, Kalanit, Nicholas Knouf, and Nancy Kanwisher. 2004. "The Fusiform Face Area Subserves Face Perception, Not Generic Within-Category Identification." *Nature Neuroscience* 7, no. 5 (May): 555–562.

Grinstead, John, Jeff MacSwan, Susan Curtiss, and Rochel Gelman. 1998. "The Autonomy of Number and Grammar in Development." In *BUCLD 22: Proceedings of the 22nd Boston University Conference on Language Development*, edited by Annabel Greenhill, Mary Hughes, Heather Littlefield, and Hugh Walsh, 303–313. Somerville, MA: Cascadilla Press.

Günther, Ursula. 1983. "Fourteenth-Century Music with Texts Revealing Performance Practice." In *Studies in the Performance of Late Mediaeval Music*, edited by Stanley Boorman, 253–270. Cambridge: Cambridge University Press.

Downloaded from http://direct.mit.edu/books/book-pdf/2437419/book_9780262356947.pdf by guest on 21 November 2024

Hall, Donald. 1960. "The Cantos in English." *The New Statesman and Nation*, March 12, 1960.

Hall, Donald. 1979. *Remembering Poets*. New York: Harper Colophon Books.

Halle, Morris, and Samuel Jay Keyser. 1966. "Chaucer and the Study of Prosody." *College English* 28: 187–219.

Halle, Morris, and Samuel Jay Keyser. 1971. *English Stress: Its Form, Its Growth and Its Role in Verse*. New York: Harper and Row.

Halle, Morris, and Samuel Jay Keyser. 1999. "On Meter in General and on Robert Frost's Loose Iambics in Particular." In *Linguistics in Search of the Human Mind: A Festschrift for Kazuko Inoue*, edited by Enoku Iwamoto, 130–153. Tokyo: Kaitakusha.

Halle, Morris, and John J. McCarthy. 1981. "The Metrical Structure of Psalm 137." *Journal of Biblical Literature* 100, no. 2 (June): 161–167.

Halsman, Philippe. 1972. *Sight and Insight*. New York: Doubleday.

Harrison, Tamara B., and Joan Stiles. 2009. "Hierarchical Forms Processing in Adults and Children." *Journal of Experimental Child Psychology* 103, no. 2: 222–240.

Hauser, Marc D., Noam Chomsky, and W. Tecumseh Fitch. 2002. "The Faculty of Language: What Is It, Who Has It, and How Did It Evolve?" *Science* 298: 1569–1579.

Hayes, Bruce. 1989. "The Prosodic Hierarchy in Meter." In *Rhythm and Meter*, edited by Paul Kiparsky and Gilbert Youmans, 201–260. Orlando, FL: Academic Press.

Hayes, Bruce, Colin Wilson, and Anne Shisko. 2012. "Maxent Grammars for the Metrics of Shakespeare and Milton." *Language* 88, no. 4: 691–731.

Hindemith, Paul. 1961. *A Composer's World*. New York: Anchor Books.

Humphrey, Nicholas. 1999. "Cave Art, Autism, and the Evolution of the Human Mind," in "Controversies in Science and the Humanities," special issue, *Journal of Consciousness Studies* 6, nos. 6–7: 116–143.

Jackendoff, Ray. 1977. Review of Bernstein, *The Unanswered Question*. *Language* 53, no. 4: 883–894.

Jackendoff, Ray, and Fred Lerdahl. 2006. "The Capacity for Music: What Is It, and What's Special about It?" *Cognition* 100, no. 1: 33–72.

Jenkins R., A. J. Dowsett, and A. M. Burton. 2018. "How Many Faces Do People Know?" *Proceedings of the Royal Society B*. https://doi.org/10.1098/rspb.2018.1319.

Kandel, Eric. 2012. *The Age of Insight*. New York: Random House.

Kandel, Eric. 2016. *Reductionism in Art and Brain Science*. New York: Columbia University Press.

Kanwisher, Nancy, Josh McDermott, and Marvin M. Chun. 1997. "The Fusiform Face Area: A Module in Human Extrastriate Cortex Specialized for Face Perception." *The Journal of Neuroscience* 17, no. 11 (June 1): 4302–4311.

Downloaded from http://direct.mit.edu/books/book-pdf/2437419/book_9780262356947.pdf by guest on 21 November 2024

Kedmey, Karen. 1999 [2004]. *MoMA Highlights*, 196. New York: The Museum of Modern Art.

Kermode, Frank. 1960. *Wallace Stevens*. London: Faber and Faber.

Keyser, Samuel Jay. 2011. "Reversals in Poe and Stevens." *Wallace Stevens Journal* 35, no. 2: 224–239.

King, Ross. 2006. *The Judgement of Paris: The Revolutionary Decade That Gave the World Impressionism*. New York: Bloomsbury.

Kirby-Smith, H. T. 1998. *The Origins of Free Verse*. Ann Arbor: University of Michigan Press.

Kramer, Hilton. 1974. "Realism: 'The Painting Is Fiction Enough.'" *New York Times*, April 28. Arts and Leisure Section.

Leech, Geoffrey N. 1973. *A Linguistic Guide to English Poetry.* London: Longman.

Lehmann, Ruth P. M. 1970. "The Old English 'Riming Poem': Interpretation, Text, and Translation." *Journal of English and Germanic Philology* 69, no. 3: 437–449.

Lengger, P. G., F. P. Fischmeister, H. Leder, and H. Bauer. 2007. "Functional Neuroanatomy of the Perception of Modern Art: A DC-EEG Study on the Influence of Stylistic Information on Aesthetic Experience." *Brain Research* 1158 (July 16): 93–102.

Lerdahl, Fred. 1989. "Atonal Prolongational Structure." *Contemporary Music Review* 4, no. 1: 65–87.

Lerdahl, Fred. 1992. "Cognitive Constraints on Compositional Systems." *Contemporary Music Review* 6, no. 2: 97–121.

Lerdahl, Fred. 2009. "Genesis and Architecture of the GTTM Project." *Music Perception* 26, no. 3: 187–194.

Lerdahl, Fred. 2019. *Composition and Cognition*. Berkeley: University of California Press.

Lerdahl, Fred, and Ray Jackendoff. 1983. *A Generative Theory of Tonal Music*. Reissued, with a new preface, 1996. Cambridge, MA: MIT Press.

Lévi-Strauss, Claude. 1962. *La pensée sauvage*. Paris: Plon.

Lieberman, Amy. 2016. Program Notes, "My End Is My Beginning." Cantata Singers, Amy Lieberman, Conductor; American Academy of Arts and Sciences, Cambridge, MA, February 26, 2016.

Mackie, W. S. 1922. "The Old English 'Rhymed Poem.'" *The Journal of English and Germanic Philology* 21, no. 3: 507–551.

Margulis, Elizabeth Hellmuth. 2014. *On Repeat: How Music Plays the Mind*. New York: Oxford University Press.

Marshall, John C. 1989. "On Making Representations." In *Vensters op de geest: Cognitie op het snijvlak van filosofie en psychologie*, edited by Colin Brown and Peter Hagoort, 292–311. Utrecht: Stichting Grafiet.

Martindale, Colin. 1990. *The Clockwork Muse*. New York: Basic Books.

Downloaded from http://direct.mit.edu/books/book-pdf/2437419/book_9780262356947.pdf by guest on 21 November 2024

Martins, Maurício Dias, Sabine Laaha, Eva Maria Freiberger, Soonja Choi, and W. Tecumseh Fitch. 2014. "How Children Perceive Fractals: Hierarchical Self-Similarity and Cognitive Development." *Cognition* 133: 10–24.

McGinn, Colin. 1993. *Problems in Philosophy: The Limits of Inquiry*. Oxford: Blackwell.

McGilvray, James. 2009. "Introduction." In Noam Chomsky, *Cartesian Linguistics: A Chapter in the History of Rationalist Thought*, 3–47. 3rd ed., with introduction by James McGilvray. Cambridge: Cambridge University Press.

McKie, Michael. 1997. "The Origins and Early Development of Rhyme in English Verse." *The Modern Language Review* 92, no. 4: 817–831.

Meyer, Leonard. 1970. Review of E. H. Gombrich's *In Search of Cultural History* (1969). *History and Theory* 9, no. 3: 397–399.

Miller, Patricia H., Frank S. Kessel, and John H. Flavell. 1970. "Thinking about People Thinking about People Thinking about … : A Study of Social Cognitive Development." *Child Development* 41, no. 3: 613–623.

Minkel, J. R. 2007. "Pollock or Not? Can Fractals Spot a Fake Masterpiece?" *Scientific American*, October 31, 2007.

Moro, Andrea. 2016. *The Boundaries of Babel*. 2nd ed. Cambridge, MA: MIT Press.

Morson, Gary Saul, and Morton Shapiro. 2017. *Cents and Sensibility: What Economics Can Learn from the Humanities*. Princeton, NJ: Princeton University Press.

Nadel, Ira. 1999. *The Cambridge Companion to Ezra Pound*. New York: Cambridge University Press.

Nevins, Andrew, and Bert Vaux. 2003. "Metalinguistic, Shmetalinguistic: The Phonology of Shm-Reduplication." In *CLS 39-1: The Main Session: Papers from the 39th Annual Meeting of the Chicago Linguistic Society*, edited by J. Cihlar, A. Franklin, D. Kaiser, and I. Kimbara, 702–721. Chicago: University of Chicago, Chicago Linguistic Society.

Newes, Colin. 1993. *Problems in Philosophy: The Limits of Inquiry*. Oxford: Blackwell.

Newes, Virginia. 1990. "Writing, Reading and Memorizing: The Transmission and Resolution of Retrograde Canons from the 14th and Early 15th Centuries." *Early Music* 18, no. 2: 218–234.

Newton, Isaac. 1726. *Philosophiae Naturalis Principia Mathematica, General Scholium*. Translated by I. Bernard Cohen and Anne Whitman. Berkeley: University of California Press (1999).

Nicholas, Christopher D., and Thomas G. Bever. 2016. "The Aesthetics of Visual Form." *Language and Cognitive Science* 2, no. 1: 1–26.

Orr, David, and Dinitia Smith. 2017. "John Ashbery, a Singular Poet Whose Influence Was Broad, Dies at 90." *New York Times*, September 3, 2017.

Downloaded from http://direct.mit.edu/books/book-pdf/2437419/book_9780262356947.pdf by guest on 21 November 2024

Page, Tim. 2016. "John Cage's Gift to Us." Review of *The Selected Letters of John Cage*, edited by Laura Kuhn. *The New York Review of Books* 63, no. 16 (October 27).

Peretz, Isabelle. 2006. "The Nature of Music from a Biological Perspective." *Cognition* 100: 1–32.

Perloff, Marjorie. 1993. *The Poetics of Indeterminacy*. Evanston, IL: Northwestern University Press.

Pinker, Steven. 2002. *The Blank Slate: The Modern Denial of Human Nature*. New York: Penguin Books.

Poirel, Nicolas, Emmanuel Mellet, Olivier Houdé, and Arlette Pineau. 2008. "First Came the Trees, Then the Forest: Developmental Changes during Childhood in the Processing of Visual Local-Global Patterns according to the Meaningfulness of the Stimuli." *Developmental Psychology* 44, no. 1: 245–253.

Pound, Ezra. 1977. *Ezra Pound and Music: The Complete Criticism*. Edited with a commentary by R. Murray Schafer. New York: New Directions.

Power, Jonathan D., Damien A. Fair, Bradley L. Schlaggar, and Steven E. Petersen. 2010. "The Development of Human Functional Brain Networks." *Neuron* 67, no. 5: 735–748.

Ramachandran, V. S. 2004. *A Brief Tour of Human Consciousness*. New York: Pearson Education.

Ramachandran, V. S., and W. Hirstein. 1999. "The Science of Art," in "Controversies in Science and the Humanities," special issue, *Journal of Consciousness Studies* 6, nos. 6–7: 15–41.

Rees, Martin. 2017. "Is There a Limit to Scientific Understanding?" *The Atlantic*, December 6, 2017.

Rehmeyer, Julie. 2007. "Fractal or Fake?" *ScienceNews* 171: 122–123.

Reuland, Eric. 2016. "Language and Imagination: Evolutionary Explorations." *Neuroscience and Biobehavioral Reviews* 29, no. 81: 255–278.

Riskin, Jessica. 2016. *The Restless Clock: A History of the Centuries-Long Argument over What Makes Living Things Tick*. Chicago: University of Chicago Press.

Rohrmeier, Martin. 2011. "Towards a Generative Syntax of Tonal Harmony." *Journal of Mathematics and Music* 5, no. 1: 35–53.

Rosenblum, Robert. 2001. *Cubism & Twentieth Century Art*. 3rd ed. New York: Harry N. Abrams.

Schiff, David. 2003. "The Secret Love Affair behind the 'Lyric Suite.'" *New York Times*, September 21, 2003.

Schlegel, August Wilhelm. 1801. *Kritische Schriften und Briefe*. Vol. II, *Die Kunstlehre*. Stuttgart: W. Kohlhammer Verlag, 1963.

Schrade, Leo, ed. 1956. Polyphonic Music of the Fourteenth Century. Vols. II–III, *The Works of Guillaume de Machaut*. Monaco: Éditions de L'Oiseau-Lyre.

Downloaded from http://direct.mit.edu/books/book-pdf/2437419/book_9780262356947.pdf by guest on 21 November 2024

Selkirk, Elisabeth. 1981. "On the Nature of Phonological Representation." In *The Cognitive Representation of Speech*, edited by Terry Myers, John Laver, and John Anderson, 379–388. Amsterdam: North Holland.

Smith, James T. 2014. "David Hilbert's Radio Address—English Translation." *Convergence* (February 2014). https://www.maa.org/press/periodicals/convergence/david-hilberts-radio-address-english-translation.

Smith, Neil, and Ianthi-Maria Tsimpli. 1995. *The Mind of a Savant. Oxford:* Blackwell.

Solso, Robert L. 1994. *Cognition and the Visual Arts*. Cambridge, MA: MIT Press.

Starr, G. Gabrielle. 2013. *Feeling Beauty: The Neuroscience of Aesthetic Experience*. Cambridge, MA: MIT Press.

Steiner, Wendy. 2001. *Venus in Exile: The Rejection of Beauty in 20th-Century Art*. Chicago: University of Chicago Press.

Stevens, Wallace. 1917. *Harmonium.* New York: Alfred Knopf.

Stravinsky, Igor. 1947. *The Poetics of Music in the Form of Six Lessons*. Translated by Arthur Knodel and Ingolf Dahl. Cambridge, MA: Harvard University Press.

Taruskin, Richard. 2005. *The Oxford History of Western Music (The Early 20th Century)*. New York: Oxford University Press.

Taylor, Carole Anne. 1985. *Poetics of Seeing*. New York: Garland.

Taylor, Richard P., Adam P. Micolich, and David Jones. 2002. "The Construction of Jackson Pollock's Fractal Drip Paintings." *Leonardo* 35, no. 2: 203–207.

Taylor, Richard P., Ben Newell, Branka Spehar, and Colin Clifford. 2005. "Fractals: A Resonance between Art and Nature." In *Mathematics and Culture II*, edited by Michele Emmer, 53–63. Berlin: Springer Verlag.

Twining, Thomas, trans. 1812. *Aristotle's Treatise on Poetry*. Translated with notes and two dissertations on poetical, and musical, imitation. 2nd ed., vol. 1. London.

Vartanian, Aram. 1960. *La Mettrie's L'Homme Machine*. Princeton, NJ: Princeton University Press.

Weinberg, Steven. 2015. *To Explain the World: The Discovery of Modern Science*. New York: HarperCollins.

Weinberg, Steven. 2017. "The Trouble with Quantum Mechanics." *New York Review of Books*, January 19, 2017.

Wimsatt, James I. 1993. *Chaucer and His French Contemporaries: Natural Music in the Fourteenth Century*. Toronto: University of Toronto Press.

Wolfe, Tom. 1975. *The Painted Word*. New York: Farrar, Straus and Giroux.

Woodward, Anthony. 1980. *Ezra Pound and The Pisan Cantos*. London: Routledge.

Zeki, Semir. 1998. "Art and the Brain." *Dædalus* 127, no. 2: 71–103.

Downloaded from http://direct.mit.edu/books/book-pdf/2437419/book_9780262356947.pdf by guest on 21 November 2024

Select Bibliography Related to Natural Aesthetics

Aiken, Nancy E. 1998. *The Biological Origins of Art*. Westport, CT: Praeger.

Armstrong, Paul B. 2013. *How Literature Plays with the Brain: The Neuroscience of Reading and Art*. Baltimore, MD: Johns Hopkins University Press.

Avanzini, Giuliano, ed. 2003. *The Neurosciences and Music*. New York: New York Academy of Sciences.

Avanzini, Giuliano, ed. 2005. *The Neurosciences and Music II: From Perception to Performance*. New York: New York Academy of Sciences.

Christensen, Julia F., and Antoni Gomila, eds. 2018. *The Arts and the Brain: Psychology and Physiology beyond Pleasure*. Cambridge, MA: Elsevier.

Cooke, Brett, and Frederick Turner, eds. 1999. *Biopoetics: Evolutionary Explorations in the Arts*. Lexington, KY: ICUS.

Crozier, W. R., and A. J. Chapman, eds. 1984. *Cognitive Processes in the Perception of Art*. Amsterdam: Elsevier.

Dutton, Denis. 2009. *The Art Instinct: Beauty, Pleasure, and Human Evolution*. New York: Bloomsbury.

Finger, Stanley, Dahlia W. Zaidel, François Boller, and Julien Bogousslavsky, eds. 2013. *The Fine Arts, Neurology, and Neuroscience: New Discoveries and Changing Landscapes*. Amsterdam: Elsevier.

Gear, Jane. 1989. *Perception and the Evolution of Style: A New Model of Mind*. London: Routledge.

Huston, Joseph P., Marcos Nadal, Francisco Mora, Luigi F. Agnati, and Camilo J. Cela-Conde, eds. 2015. *Art, Aesthetics, and the Brain*. Oxford: Oxford University Press.

Ione, Amy. 2016. *Art and the Brain: Plasticity, Embodiment, and the Unclosed Circle*. Boston: Brill.

Jones, Caroline A., and Peter Galison, eds. 1998. *Picturing Science, Producing Art*. New York: Routledge.

Kandel, Eric R. 2016. *Reductionism in Art and Brain Science: Bridging the Two Cultures*. New York: Columbia University Press.

Kapoula, Zoï, and Marine Vernet, eds. 2016. *Aesthetics and Neuroscience: Scientific and Artistic Perspectives*. Cham, Switzerland: Springer.

Kemp, Martin. 2006. *Seen/Unseen: Art, Science, and Intuition from Leonardo to the Hubble Telescope*. Oxford: Oxford University Press.

Massey, Irving. 2009. *The Neural Imagination: Aesthetic and Neuroscientific Approaches to the Arts*. Austin: University of Texas Press.

Mather, George. 2014. *The Psychology of Visual Art: Eye, Brain and Art*. Cambridge: Cambridge University Press.

Mithen, Steven J. 1996. *The Prehistory of the Mind: A Search for the Origins of Art, Religion, and Science*. London: Thames and Hudson.

Downloaded from http://direct.mit.edu/books/book-pdf/2437419/book_9780262356947.pdf by guest on 21 November 2024

Noë, Alva. 2015. *Strange Tools: Art and Human Nature*. New York: Hill and Wang.

Parker, D. M. 1990. *Perception and Artistic Style*. Amsterdam: Elsevier.

Peretz, Isabelle, and Robert Zatorre, eds. 2003. *The Cognitive Neuroscience of Music*. Oxford: Oxford University Press.

Rampley, Matthew. 2017. *The Seductions of Darwin: Art, Evolution, Neuroscience*. University Park: Pennsylvania State University Press.

Rothenberg, David. 2012. *Survival of the Beautiful: Art, Science, and Evolution*. London: Bloomsbury.

Shimamura, Arthur P. 2011. *Aesthetic Science: Connecting Minds, Brains, and Experience*. Oxford: Oxford University Press.

Solso, Robert L. 2003. *The Psychology of Art and the Evolution of the Conscious Brain*. Cambridge, MA: MIT Press.

Turner, Mark. 2006. *The Artful Mind: Cognitive Science and the Riddle of Human Creativity*. Oxford: Oxford University Press.

Weir, Catherine, and Evans Mandes. 2017. *Interpreting Visual Art: A Survey of Cognitive Research about Pictures*. New York: Routledge.

Zeki, Semir. 1999. *Inner Vision: An Exploration of Art and the Brain*. Oxford: Oxford University Press.

Downloaded from http://direct.mit.edu/books/book-pdf/2437419/book_9780262356947.pdf by guest on 21 November 2024

Index

Note: page numbers in italics refer to figures.

Abstract expressionism, 86
Accessibility of poetry, 33–34
Accordionist, The, 160, 161, *162*
Adams, John (composer), 129
Adventure, 105
Aesthetic Brain, The, 83
Alliteration, 46–47, 53, *55*
  syllable structure and, 47–49
Apollinaire, Guillaume, 151
Apollonius of Tyana, 77, 82, 157
Aristotle, 124
Arnheim, Rudolf, 3
Art
  caricatures in, 146
  commercial, 149
  cubist, 158–164
  instinctual nature to make, 164–165
  mimetic (*See* Mimetic art)
  narrative in premodernism, 125
  peak shift in, 146
  pleasure of, 65–67, 124–125
  pop, 149, 154
  postmodern, 133–137
  surrealist, 135–136
  three periods of Western, 86
  universal laws of, 146
  visual recursion in, 139–140
"Art: A Tail or a Song?," 164, 166
Ashbery, John, 26, 120–123, 125–128, 151, 173
Atari, 17
Atonality, 101–102, 143–144, 164
Autistic language savants, 11–15
Aviv, Vered, 133–135

Ball, Hugo, 74–75
Ball, Philip, 176–177
Baudelaire, Charles, 30, 98, 170
Beauty
  brain evaluation of, 83
  retreat from feminine, in modernism, 84
Bell, John, 177
Bentham, Jeremy, 59
Beowulf, 29, 46
Berg, Alban, 102
Bernstein, Leonard, 97, 101, 143–144
Bever, Thomas, 64–65, 67, 140, 141
Beyond Weird, 176
Bilgrami, Akeel, 167
Black Square, 161–163
Blank Slate, The, 1, 133
Body recognition by the brain, 80–81
Boretz, Benjamin, 170
Brain, the, 67, 173
  aesthetic evaluation by, 82–83
  body recognition by, 80–81
  Broca's area of, 15–16, 137
  face detection and identification and, 79–80
  functional aspect of, 82
  golden mean interpretation by, 140–142

Downloaded from http://direct.mit.edu/books/book-pdf/2437419/book_9780262356947.pdf by guest on 21 November 2024

Brain (cont.)
interpretation of distance in, 141–142
interpreting mimetic art, 79–83
in language acquisition, 15–16
limits to understanding by, 175–178
linkages between sister arts and privileges categories of, 146–147
parahippocampal place area (PPA), 81–82
reaction to postmodern art in, 133–135
Braque, Georges, 80, 150, 158–161
Bride Stripped Bare by Her Bachelors, Even (The Large Glass), The, 102, *103*
Brillo Box, 149, 152, 153
Broca's area, 15–16, 137
"Broken Dreams," 56–57
Burroughs, William, 125
Burton, A. M., 80

Cage, John, 128–130, 153
Campaign of France, 93
Campbell's Soup Cans, 149, 154, *156*
Canterbury Tales, The, 31
Capitalized Poetry, 37–39
Caricatures, 146
Chatterjee, Anjan, 65, 67, 82, 83, 146, 164–166
Chaucer, Geoffrey, 24–26, 31, 37–38, 45, 60, 120, 174
Chomsky, Noam, 12, 35–36, 152, 165, 167, 169–171, 183–185
Christ and the Samaritan Woman, *89*
Christopher (autistic language savant), 11–15
Chun, Marvin, 79
Cimabue, 88, 89
Coates, Robert, 136
Collins, Billy, 33, 121
Commercial art, 149
Complaynt of Venus and Mars, The, 24
Conjunctions and conjoined objects, 106–115
Connor, Russell, 84, 85, 178
Constable, John, 87, 88, 96, 141
Constructivism, 85
Corporate logos, Easter eggs in, 20–21
Corso, Gregory, 125
Counting, 12
Crucifix, *88*
Crux moments in Western intellectual history, 167
Cubism, 158–164
Cummings, e. e., 63–64
Curtiss, Susan, 61–62

Dadaism, 74–75, 85, 125, 128, 149
Dædalus, 79
Dali, S., 17, *19*, 19–20
Danto, Arthur, 86, 130, 149–150
Delaroche, Paul, 4
Deliège, Irene, 71
Della Francesca, Piero, 79, 89, *90*
Demme, Jonathan, 20
Descartes, René, 165, 167–168, 183–184
Deutch, David, 175, 176
"A Disservice," 125–127
Distortion in portraits, 84–85
Doolittle, H. D., 151
Downing, Paul, 80
Dowsett, A. J., 80
Drip paintings, Pollock, 137–138
Dr. Seuss, 67
Duccio di Buoninsegna, 89
Duchamp, Marcel, 102, *103*, 125, 149, 154, 156
Duplication and changing of words, 53–54

Easter eggs
in corporate logos, 20–21
defined, 17
in FedEx logo, 20–21
in film, 17–20
fun of hunting for, 26–27
in poetry and music, 21–26, 34, 37–38, 102–105
Einstein, Albert, 175, 179
"Elegy Written in a Country Churchyard," 43, 172

Downloaded from http://direct.mit.edu/books/book-pdf/2437419/book_9780262356947.pdf by guest on 21 November 2024

Eliot, T. S., 29, 98
"Emperor of Ice-Cream, The," 34–35
End rhyme, 46–47, 50–53, *55*
Epstein, Russell, 81
Ernst, Max, 135
Eschbeg set, 99–100, 105
Escher, M. C., 94
"Europe," 123
Expressionism, abstract, 86

Fabb, Nigel, 60
Face detection and identification, 79–80
FedEx logo, 20–21
Femme tenant une mandoline, 80
Fountain, 149, 156
Fourteener meter, 52–53
Fractal patterns, 136–137, 139
Freedom, 29–30
Free verse, 35, 45, 63
  line endings in, 60
French Revolution, 171
Frost, Robert, 1, 29, 30, 68
Fuchs-Robettin, Hanna, 102
Functional magnetic resonance (fMRI) imaging, 15, 79–81
Fusiform face area (FFA), 79

Galilean revolution, 8–9, 167, 170, 183, 185
Garden path sentences, 106, 110
Generative Theory of Tonal Music, A, 69
Gill, Kamraan, 72
Girl before a Mirror, 84, *85*, 178
Girl with a Mandolin, 80, *159*, *160*
Gleaners, The, 4
Golden mean, 140–142
Gombrich, E. H., 5, 77, 96, 135–136, 141, 150
Goodall, Howard, 100–101
Gopnick, Allison, 65
Graham, Jorie, 31–32, 37, 38–39, 60, 63, 173
Grammar and syntax, 152
Granson, Oton de, 24–25, 37–38, 120
Gravitational waves, 179
Gray, Thomas, 43, 44, 172
Greenberg, Clement, 2
Gregorian chant, 74–75
Gris, Juan, 160

Hall, Donald, 99
Halle, Morris, 60
Halsman, Philippe, 17, *19*, 19–20
Hayes, 63
Hegel, G. W. F., 5
Hegelianism, 5–6
Hilbert, David, 174–175, 176
Hindemith, Paul, 101
Hippocrates, 168
Hobbes, Thomas, 175
Hogarth, William, 90, *93*, *94*, 141, 159
Hopper, Edward, 124–125
Houssaye, Arsène, 98
"How Many Bards Gild the Lapses of Time," 42, 49–50, 104, 127
Hugo, Victor, 30

Iambic pentameter, 58, 59, 98
Imagism, 151
Imagiste, 151
Indeterminacy, poetry of, 122, 123–124, 173
Industrial Revolution, 4, 6
Instinctive appreciation, 137
"Introduction to Poetry," 33
In Voluptate Mors, 17, *19*, 20
Isochrony, 73–74
I've Got a Secret, 128–129

Jackendoff, Ray, 69–70, 71, 73, 101, 105, 143–144
Jenkins, R., 80
Judgment of Paris, The, 153, *154*, *155*

Kandel, Eric, 3, 65, 80, 81, 84, 157
Kanwisher, Nancy, 79, 81, 82
"Karawane," 74–75
Keats, John, 42–43, 44, 49, *55*, 127
Kermode, Frank, 118
Keyser, Samuel Jay, on pleasure of art, 65–67

Downloaded from http://direct.mit.edu/books/book-pdf/2437419/book_9780262356947.pdf by guest on 21 November 2024

King, Ross, 153
King Lear, 43–44
Kirby-Smith, H. T., 45, 60, 127, 152–153
Klee, Paul, 163–164
Klimt, Gustav, 84
Kline, Franz, 141, *142*, 164
Kokoschka, Oskar, 84
Komar, Vitaly, 87
Kramer, Hilton, 150

Language acquisition, 11–15
  Broca's area in, 15–16
Language understanding
  conjunctions and, 106–110
  garden path sentences and, 106
Las Meninas, 89, *92*
Leader, Lindon, 20–21
Le déjeuner sur l'herbe, 153–154, *155*
Léger, Fernand, 160–161
Lehmann, Ruth, 45
Lengger, P. G., 133
Lerdahl, Fred, 69–71, 73, 105, 130–131, 143–144, 151
Les orientales, 30
Le Spleen de Paris, 98, 125
Lowell, Robert, 29
Lowercase poetry, 37–39
Lyric Suite, 102

Machaut, Guillaume de, 21–23, 37–38, 120, 174
Madame X, 84, *85*, 178
"Ma fin est mon commencement," 21–23
Mahler, Gustav, 44, 97–98, 170
Making and Appreciating Art, 130
Malevich, Kazimir, 161–164
Manet, Édouard, 153–154, *155*, 157
Mantegna, Andrea, 77, *78*
Man with a Guitar, 160, *161*
Margulis, Elizabeth, 145
Martindale, Colin, 4
Martins, Maurício Dias, 137–139
Marvell, Andrew, 31–32, 38, 152
Masson, André, 135
Maximus Poems, 152
McDermott, Josh, 79
McGilvray, James, 165
McGinn, Colin, 177–178
McKie, Michael, 45, *55*
Meissonier, Ernest, 86, *93*, *96*
Melamid, Alexander, 87
Meter, 41–42
  iambic pentameter, 58, 59, 98
  line as basic unit of, 56–57, 58–59
  line endings and, 59–60, 68
  modernism and shift away from, 61–62
  opportunities for problem-solving with, 67–68
  stress maximum and, 44, 62
Metrical poetry, 29–30, 31, 43, 172
  abandonment of, 98–99
  line endings in, 59–60
Metrical structure in music, 73
Meyer, 5–6
Millet, Jean-François, 4
Milton, John, 31, 55–56, 57–58, 60
Mimetic art, 149–151, 153
  13th–19th century paintings, 87–89
  aesthetic evaluation by the brain and, 82–83
  ancient, 86
  beginning of end of, 153
  brain interpretation functions and, 79–83
  distortion in, 84–85
  examples of, 77, *78*
  face detection and identification and, 79–80
  Necker cube in, 90–96
  pushing against boundaries, 85–86
  rejection of feminine beauty and, 84
Minerva Expelling the Vices from the Garden of Virtue, 77, *78*
Miró, Joan, 164
Modernism, 1–2
  absence of discernible narrative in poetry of, 152
  art period, 86
  Blank Slate theory and, 133
  compared to the Galilean revolution, 8–9, 167

Downloaded from http://direct.mit.edu/books/book-pdf/2437419/book_9780262356947.pdf by guest on 21 November 2024

as crux moment in Western intellectual history, 167
cultural explanations for, 2–7, 171–172
as maximization, 97
retreat from feminine beauty in, 84
Mona Lisa, 77
Mondrian, Piet, 86, 163
Monroe, Harriet, 151
Moore, Gary, 128
Moro, Andrea, 15–16, 164, 173
Morson, Gary Saul, 2
Most Wanted Painting, 87
Music
atonal, 101–102, 143–144, 164
constraints added to, 73–74
Dada-influenced, 128–129
Easter eggs in, 21–26, 102
Eschbeg set, 99–100, 105
gathering sequences of notes into groups in, 70–71
Gregorian chant, 74–75
hearing of, 69
isochrony in, 73–74
metrical structure in, 73
new definitions of, 128–130
pushing the boundaries of, 97–98, 99–102, 170
recursion in, 145
sharp differences in tonality of, 70–71
tonal, 70–74, 97–98, 101
universality of scales in, 72

Narrative structure, 125
Natural aesthetic, 8, 11, 41, 65, 153, 157, 174, 178–179
Necker cube, 90–96
Nevins, Andrew, 54
Newes, Virginia, 21
Newton, Isaac, 8, 167–169, 184
Newtonianism, 167–168
New Yorker, 84, *85*, 178
Nicholas, Christopher, 140, 141

"Old Age Sticks," 63–64
Olson, Charles, 152
One: Number 31, 135
On the Perspective of Painting, 79
Orgy, The, 90, *93*, *94*, 141, 159
Osmond, Marie, 75
Oxford History of Western Music, 4

Page, Tim, 130
Paluska, Duane, 124
Paradise Lost, 55–56, 57–58, 60
Parahippocampal place area (PPA), 81–82
Peak shift, 146
Peretz, Isabelle, 71–72
Perloff, Marjorie, 121–124, 151, 152
Perrin, Jean Baptiste, 168–169
Phonology, 62–64
Picasso, Pablo, 80, 84, 85, 158–162, 178
Pierrot Lunaire, 144
Pig Latin, 47–49
Pinker, Steven, 1, 133, 146–147
Pisan Cantos, The, 58–59, 60, 98
Poe, Edgar Allan, 46, 67
Poetic faculty, 35–36
Poetics (Arisotle), 124
Poetics of Music in the Form of Six Lessons, The, 181–182
Poetry
about poetry, 42–43
accessibility of, 33–34
alliteration in, 46–49, 53, 55
capital P *versus* lowercase p, 37–39
conjunctions and conjoined objects in, 106–115
cutting up, 126–127
Dada movement, 74–75
disappearance of discernible narrative in, 152–153
Easter eggs in, 21–26, 34, 37–38, 102–105
free verse, 35, 45, 60, 63
imagism, 151
of indeterminancy, 122, 123–124, 173
meaning in, 31–39
meter in (*see* Meter)

Downloaded from http://direct.mit.edu/books/book-pdf/2437419/book_9780262356947.pdf by guest on 21 November 2024

Poetry (cont.)
metrical, 29–30, 31, 43, 59–60, 98–99, 172
modernism's changes in, 61–62, 172–173
phonology and, 62–64
pushing the boundaries of, 98–99
rhyme in (*see* Rhyme)
rules of, 29, 31–39
what constitutes, 36–37
Poetry Magazine, 151
Poetry of Indeterminacy, The, 151
Poincaré, Henri, 179
Polanyi, Michael, 179
Pollock, Jackson, 26, 86, 135–137, 153
Pop art, 149, 154
Postmodernism, 1, 27, 86
art of, 133–134
fractal patterns in, 136–137, 139
pop art and, 149, 154
surrealism in, 135–136
Post-Newtonian science, 170
Potato Harvest, The, 4
Pound, Ezra, 4, 30, 58–60, 98–99, 151, 152–153, 170
Principia, 168
Private format
Easter eggs in, 17, 102–105
in poetry, 98–99, 106–131
pushing boundaries, 97–99
in tonal music, 97–98, 99–102
Privileged categories of face, place, and body, 83–84, 136
in 13th–19th century paintings, 87–89
linkages between sister arts and, 146–147
Proust, Marcel, 66
Purves, Dale, 72

Quantum mechanics, 175–177

Raimondi, Marcantonio, 153, *154*, *155*
Ramachandran, V. S., 62, 65, 67, 146
Raphael, 89, 153–154
"Raven, The," 46
Reader, The, 146–147
Recursion
in music, 145
visual, in art, 139–140
"Red Wheelbarrow," 152
Rees, Martin, 175–176
Rembrandt, 84–85
Remembrance of Things Past, 66
Resurrection, The, 90
Rhyme
alliteration and, 46–47, 53, 55
duplication and changing of words and, 53–54
end rhyme, 46–47, 50–53, 55
fourteener, 52–53
in free verse, 45
in *King Lear*, 43–44
modernism and shift away from, 61–62
opportunities for problem-solving with, 67–68
origins of, 45
prominence in English poetry, 46
rule systems for, 41–42, 46–55
shared rules by poet and listener and, 42–43
stressed vowels in, 50–53, 55
syllables in, 43
Rhymes with Orange, 95, *96*
"Rhyming Poem," 45, 47
Ring Cycle, 4
Riskin, Jessica, 8, 167–168
Robinett, Warren, 17
Rosenblum, Robert, 158–163
Rothko, Mark, 134, 142
Rules, 7–8
abandonment of natural aesthetic, 157, 174
freedom with, 29–30
in games, 29
meaning of, 31–39
of mimetic art (*see* Mimetic art)
of music (*see* Music)
"natural," 15
need for, 29–30
of poetry (*see* Poetry)

Downloaded from http://direct.mit.edu/books/book-pdf/2437419/book_9780262356947.pdf by guest on 21 November 2024

stress maximum, 44
tradition of shared systems of, 11, 42–43, 53, 71

Safer, John, 66
Salonen, Esa-Pekka, 75
"San Sepolcro," 31–33, 60, 63
Sargent, John Singer, 84, *85*, 178
Scales, music, 72
Schiele, Egon, 84
Schlegal, August Wilhelm, 35–37, 41
Schoenberg, Arnold, 26–27, 99–100, 105, 127, 130, 164
Science and scientific method, 8, 167–169, 173
and limits to human understanding, 175–176
mechanical philosophy of, 169–170
predictive power of, 179
Sechs kleine Klavierstücke, 100
Shakespeare, William, 43–44, 62
Shapiro, Morton, 2
Shklovsky, Viktor, 151
Silence of the Lambs, 17, *18*
Simons, Hi, 119
Six Pieces, 100, 127
Slate, 53
Smith, Neil, 12, 13, 14–15
Sneeze, The, 20
Snow, C. S., 67
"Snow Man, The," 105–119, 138–139
Sobel, Janet, 135
Soulages, Pierre, 141, 143, 164
Sower, The, 4
Spring and All, 152
Stein, Gertrude, 151
Steiner, Wendy, 84
Stevens, Wallace, 29, 34–35, 102–104, 105, 107, 118–120, 138–139
Still Life: The Table, 150
Stokes, Geoffrey, 34, 118
Story of Art, The, 135
Stravinsky, Igor, 30, 131, 181–182
Stressed vowels, 50–53, *55*
Stress maximum, 44, 62
Structural dependence, 13
Stuart, Gilbert, 154
Suprematism, 85
Surrealism, 135
"Susie Asado," 151
Syllables, 43
structure of, 47–49
Syntactic Structures, 152

Tachism, 85
Taruskin, Richard, 4, 97–98, 101
Taylor, Carole Anne, 152
Taylor, Richard P., 136–137
Tender Buttons, 151
"Theory," 102–103, 105
"These Lacustrine Cities," 120–122, 123, 124, 151
3 Avril 1954, *143*
"To His Coy Mistress," 31–32, 104, 152
Tonal music, 70–72, 101
atonality and, 101–102
boundaries of, 97–98
constraints and, 73–74
Tsimpli, Ianthi-Maria, 12, 13, 15
Twining, Thomas, 123–124
Tzara, Tristan, 75, 123, 125, 128

Unanswered Question, The, 101
Universal laws of art, 146

Vass, Lindsay, 81
Vaux, Bert, 54
Velázquez, Diego, 89, *92*
Venus in Exile: The Rejection of Beauty in 20th-Century Art, 84
Vorticism, 85

Wagner, Richard, 4
Warhol, Andy, 149, 152–154, 156
Washington, George, 154
"Waste Land, The," 60
Water Walk, 128–130
Weinberg, Stephen, 176
Weiss, Rainer, 179
What Kind of Creatures Are We?, 167
White Center, 134, 142
White Painting, 142
Whitman, Walt, 58

Downloaded from http://direct.mit.edu/books/book-pdf/2437419/book_9780262356947.pdf by guest on 21 November 2024

Williams, William Carlos, 60, 151–153
Wirtz, Anna, 34–35
Wivenhoe Park, 87, *88*, 96, 141
Woman with a Mandolin, 158
Woodbury, Charles, 124
Woodward, Anthony, 59

Zeki, Semir, 79, 96

Downloaded from http://direct.mit.edu/books/book-pdf/2437419/book_9780262356947.pdf by guest on 21 November 2024